

**CHAPTER 5
CUMULATIVE IMPACTS**

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CHAPTER 5 CUMULATIVE IMPACTS

The regulations of the Council on Environmental Quality (CEQ) implementing the National Environmental Policy Act (NEPA) define a cumulative impact as “the impact on the environment which results from the incremental consequences of an action when added to the other past, present, and reasonably foreseeable future actions, regardless of what agency or person undertakes such other actions” (40 CFR 1508.7). For Dakota, Minnesota, and Eastern’s (DM&E’s) proposed Powder River Basin (PRB) Expansion Project, the Section of Environmental Analysis (SEA) addressed cumulative impacts in this Draft EIS, where appropriate, because the environmental effects of the proposed PRB Expansion Project, when added to or in interaction with other actions that are not related to the proposed DM&E project, could result in cumulative impacts that may be significant. This chapter presents SEA’s evaluation of potential cumulative impacts.

NEPA created the CEQ to develop policy guidelines and oversee the Federal agencies’ implementation of NEPA. To assist Federal agencies in assessing cumulative impacts under NEPA, CEQ developed a handbook entitled *Considering Cumulative Effects under the National Environmental Policy Act*. Using these guidelines, SEA evaluated the cumulative impacts from the proposed DM&E Construction and Rebuild into the PRB. SEA identified past, present, and reasonably foreseeable changes that could result in cumulative environmental impacts when combined with the environmental effects of the Proposed PRB Expansion Project. Specifically, SEA evaluated activities that, when combined with the potential impacts of the Proposed PRB Expansion Project, could result in significant cumulative environmental effects from changes in railroad operations and from construction activities. SEA evaluated other local projects or activities, that agencies and the public have brought to SEA’s attention and SEA determined could have cumulative impacts warranting environmental review.

DM&E’s proposed PRB Expansion Project traverses the three States of Minnesota, South Dakota, and Wyoming and is composed of several project components that include the following:

- Reconstruction of existing rail line
- Construction of new rail line
- Construction of connecting tracks
- Construction of rail yards
- Construction of maintenance facilities
- Proposed construction of alternative segments and bypass routes

Additionally, each component has multiple proposed alternatives. SEA has evaluated the impact of each individual project component and all proposed component alternatives to determine the proposed alternative with the least overall impact to the natural and human environments. The following Sections provide a summary of the potential impacts that SEA identified for each project component along with those reasonably foreseeable actions that could create or lead to cumulative impacts on natural and man-made resources within the project area.

Section 5.1 discusses the potential impacts of the various components of the proposed PRB Expansion Project. The total impacts for the proposed PRB Extension Project may be determined by totaling the anticipated impacts of a specific set of project alternatives. In Section 5.2, SEA discusses, by state, all reasonably foreseeable local projects that could contribute to the overall environmental impacts within the project area. Section 5.3 summarizes the impacts of the proposed project and the other foreseeable actions.

5.1 SUMMARY OF IMPACTS FROM PROPOSED ACTION

SEA evaluated each project component and its corresponding component alternatives for impacts to the environment. The environmental impacts resulting from the construction and operation of each project component of the proposed PRB Expansion Project would depend on the combination of project component alternatives that are selected. It is important to note that each of the project components are independent of one another. The anticipated impacts resulting from each of the project component alternatives are summarized in Tables 5.1-1 to 5.1-15 included at the end of this chapter. The cumulative environmental impacts resulting from the proposed PRB Expansion Project would be the result of the total impacts of the selected project component alternatives. Below is an example of how to determine the cumulative impact(s) to prime farmland from the following chosen project component alternatives. This example represents information from 5 different summary tables. By adding each of the totals for prime farmland, the total impact to prime farmland can be determined.

Feature	(Table 5.1-1) Extension Alternative B	(Table 5.1-2) Spring Creek Segment	(Table 5.1-3) Hay Canyon Segment	(Table 5.1-4) Black Thunder South Mine Loop	(Table 5.1-5) North Antelope West Mine Loop	Total
Acres Prime Farmland	1,013.3	0.0	373.3	0.0	0.0	1,386.6

To determine the full impact to prime farmland from the proposed PRB Expansion Project, the reader must also include the acres of prime farmland that would be affected by each of the other project components (reconstruction in South Dakota, Brookings Bypass, reconstruction in Minnesota, connecting track in Mankato, Owatonna Alternatives, and Rochester Bypass).

Due to the nature and scope of the PRB Expansion Project and the large number of potential combinations of alternatives, SEA did not prepare a table that depicts each combination of project components, alternatives, and all other past, present, and reasonably foreseeable projects. Instead, SEA has compiled a series of tables that summarize the potential cumulative impacts that may result. In addition, SEA has also included tables that are specific to each PRB Expansion Project component. These tables identify the specific environmental impacts associated with each project component and its applicable alternatives. These tables identify the overall project impact to a specific environmental resource.

Generally, reconstruction activities would result in temporary impacts to the human and natural environment located along the existing rail line. Impacts to various natural resources that occur within the right-of-way would include loss of wildlife habitat, wildlife disturbance, loss of vegetative and wetland communities (that have become established within the existing right-of-way), increased vehicle traffic, dust, noise and vibration levels, vehicle delays during crossing reconstruction, and a temporary reduction in grade crossing safety.

Construction of new rail line would create impacts similar, but greater in quantity and magnitude due to more earthwork required, to reconstruction. However, ground disturbance would be more extensive due to cut and fill activities, and occur over a longer period of time in any given area due to the earthwork necessary to establish a rail bed. Following construction, all lands within the right-of-way would be converted to railroad use. Significant loss of wetlands and changes in land use are anticipated. Following completion of reconstruction and construction activities (approximately two-three years for the entire project), and successful implementation of mitigation measures, the level of impact from these activities would be expected to decrease.

Following completion of the reconstruction and new construction activities, operation of the DM&E rail line would continue to impact many of the same resources. However, the type of impacts would differ. The daily level of traffic on the rail line would increase, as would the speed and length of trains operating on the rail line. SEA recognizes that many resources could be affected by the operation of the proposed project. However, the most significant impacts would occur to the human environment, particularly increased noise. At higher levels of operation, significant reductions in visibility at Class I areas are anticipated (Class I areas are those designated by Congress as having a “special national or regional value from a natural scenic, recreational or historic perspective.” and are therefore afforded a higher level of protection from increased air pollution.) Examples of Class I areas would be wilderness areas, and National Parks. Higher levels of operation would also result in increased accident frequency at approximately 30 public grade crossings. Potential impacts resulting from construction, reconstruction, and operation of the proposed PRB Expansion Project, for each component alternatives are summarized in tables 5.1-1 to 5.1-15. These tables include potential impacts to the natural and human environment which were analyzed by SEA. Each table offers a brief summary of potential impacts that could result from construction and operation of the chosen alternative for a particular project component. With regard to reconstruction of existing DM&E rail line in Minnesota and South Dakota the only alternatives presented in the Draft EIS are reconstruction and No-Action. The No-Action Alternative is not summarized in the table. However, as discussed in Chapters 3 and 4, the No-Action Alternative could have significant adverse impacts on safety.

5.2 SUMMARY OF REASONABLY FORESEEABLE PROJECTS

The proposed PRB Expansion Project would extend approximately 900 miles, from Winona, Minnesota to access the coal mines of the Powder River Basin in northeast Wyoming. The proposed project would cross a variety of land use types, developed and undeveloped, and affect numerous elements of the human and natural environments. The proposed PRB Expansion Project would involve the construction of new rail facilities in or near towns and communities ranging in size from a few citizens, to larger metropolitan areas such as Rochester, Minnesota. In addition to impacts resulting from the proposed project, SEA is aware of other actions, unrelated to the proposed project, which could contribute to the total impacts occurring to the natural and human environment within the project area. SEA has contacted state and local government agencies in Minnesota, South Dakota, and Wyoming, to identify any reasonably foreseeable actions that could result in cumulative impacts. Following is a state-by-state summary of reasonably foreseeable actions identified within the PRB Expansion Project area.

5.2.1 Minnesota

SEA contacted state and local government agencies throughout the Minnesota project area, and reviewed media information to identify any reasonably foreseeable projects that may occur over approximately the next three years. The results of the search include several road and highway projects, and local construction projects that are proposed within or near the project area (Table 5.2-1).

<p align="center">Table 5.2-1 Reasonably Foreseeable Actions In Minnesota</p>	
Source of Information	Description of project
Blue Earth County Public Works	Various small road projects and overlays (repaving) proposed.
Lincoln County Assessor	Proposed Wind Tower Hotel northwest of Lake Benton
Lincoln County Engineering Department	Regrading and widening of County Road 111 from Highway 14 to State Highway 13. Reconstruction of State Highway 7, from Tyler north 5 miles.
Brown County Planning and Zoning/ Solid Waste Management	Additional fertilizer storage facilities proposed for Sleepy Eye Farms adjacent to the existing rail line.
Brown County Engineering	Resurfacing and overlay of County Road 29 and County Highways 2, and 24. Resurfacing of County Road 4 near DM&E tracks in Sleepy Eye.
Waseca County Zoning and Planning	Remodification of sugar beet factory located directly adjacent to existing DM&E rail line.
Waseca County Engineering Department	Reconstruction of County Road 2, south from Janesville to Waseca. No major projects in the 10-year plan.
Steele County Engineering Department	Overlay to various western county roads, Three bridges to be replaced with box culverts, and one span bridge replacement.
Olmsted County Engineering Department	Reconstruction and repaving of Highway 7, east of Rochester. Overlay of Highway 3 west of Rochester. County Road 104 and County Road 10 possible overlay planned.

In addition to these relatively minor projects, SEA is aware of three larger projects where environmental impacts could potentially overlap and result in cumulative impacts. Following is a brief discussion of these projects and the environmental impacts that may result from their construction and operation.

Blue Earth County, Minnesota is constructing a 20.0-mile, two-lane rural county highway around the south side of Mankato known as the Mankato South Route (South Route). It is anticipated that much of this two-lane county highway will need to be expanded to four lanes in the future. Right-of-way has been obtained to allow for this four-lanes expansion when necessary. Impacts resulting from this construction include conversion of undeveloped land to highway right-of-way and loss of prime farmland. Ground disturbing activities would be expected to cause increased total suspended solids (TSS) in nearby surface water resources until such time that vegetation becomes re-established in the construction area. Loss of permeable soil resulting from highway construction could cause changes in the absorption of storm water. Bridges are proposed to span the Le Sueur River and the Blue Earth River. Changes to wetland vegetation would be expected at river crossings, caused by clearing and a shadowing effect from bridges. Wetland vegetation that requires sunlight could be lost, those that prefer shade would be encouraged. Loss of wetland habitat and native vegetation would be expected to occur along the highway right-of-way. Loss of, and changes to wildlife habitat would be expected to impact local wildlife populations. Wildlife mortality from roadway collisions is also anticipated. Air quality in the project area would decrease during construction resulting from dust and equipment emissions. No significant air quality impacts are expected during operations although substantially more vehicles would travel through the area. Noise levels would increase during construction and operation from vehicles traveling through the area. Transportation routes in Mankato would likely experience positive impacts following the completion of this action. Traffic, including large trucks that were previously routed through Mankato, will now bypass the city. Traffic congestion in town, and related safety concerns would be expected to decrease following completion of the South Route. Plans for the South Route also include a bicycle path to be constructed adjacent to the roadway. This bicycle path would connect to existing bike paths in the Mankato area and enhance recreational opportunities in the project area.

On the north side of Mankato, in Lime Township, Mankato-Kasota Stone has purchased 55.0 acres of agricultural land to increase their current limestone quarrying operation. Mankato-Kasota Stone, as well as Vetter Stone and Southern Minnesota Construction, operate limestone quarries in the Mankato area. The new Mankato-Kasota Stone quarry would be approximately 30.0 acres in size. The facility will quarry high quality limestone for use in the building industry. The yellow-tinted limestone known as Kasota Stone is found in a corridor from Mankato to Kasota, Minnesota and has been quarried in this region for over 100 years. The limestone has been used for such structures as railroad bridges, homes, and local buildings. The proposed

Mankato-Kasota Stone quarry project's zoning and permitting process is managed by the City of Mankato. Public meetings are scheduled to address possible concerns of nearby residents. Potential impacts resulting from this proposed project would include decrease of permeable soil, increased dust, disturbance to the water table, loss of agricultural land, increased traffic on local roads that access the quarry, road deterioration from large heavy trucks, and increased noise from blasting and mining activities. Township officials and those from the Mankato Planning and Zoning office are preparing proposed operating conditions for the proposed quarry. An Environmental Assessment Worksheet has been drafted by an outside environmental firm and is also being reviewed by City and township officials.

The Rochester International Airport, located approximately eight miles south of Rochester, Minnesota is undertaking a runway expansion project. Runway number 20 is being extended an additional 2,200 feet in length. Ground clearing has been completed but no other construction activities are underway. Ground clearing for the 2,200 foot by 750 foot runway extension has resulted in the loss of grassland vegetation and habitat. Wildlife species which inhabited this grassland have been forced to relocate to suitable, nearby habitat. Construction could increase the total suspended solids (TSS) in surface water resources. The completed runway would decrease the amount of permeable soil in the project area which could lead to increased storm water runoff and erosion. The runway extension does not cross any roadways. One small emergent wetland was lost during ground clearing operations. Information concerning a time frame for the completion of the runway is not available. However, following completion, air traffic could increase, resulting in increased noise from operating aircraft, increased traffic on roadways accessing the airport, and increased air emissions from aircraft operation.

5.2.2 South Dakota

SEA contacted state and local government agencies throughout the South Dakota project area and also reviewed media information to identify any reasonably foreseeable actions that could contribute to cumulative impacts. SEA identified one project that could contribute to the impacts expected to result from the proposed PRB Expansion Project. SEA is aware that the Huron City Commission and the Beadle County Commission have approved an action to establish a Beadle County Regional Railroad Authority. Establishment of the Beadle County Regional Railroad Authority will enable Farmland Industries and the adjacent Heartland Grain Fuels to make improvements to a railroad spur that currently serves Farmland Industries, and expand the track to serve Heartland Grain Fuels. Heartland Grain Fuels, a corn ethanol producer in Huron, currently uses loading and unloading facilities at Farmland Industries. Expansion of the rail spur would allow Heartland Grain Fuels to load and unload at their own facility. Improvement of this rail spur would facilitate efficient rail transportation and allow for future growth in both these industries. Improvements to the existing rail spur would be done within the existing rail line right-

of-way and would therefore have minimal impacts to the natural and human environment. These impacts would likely be in the form of increased dust and noise during construction. Extending the rail line would require ground disturbing activities, which would likely result in minor impacts to the soil and the loss of small amounts of vegetation.

5.2.3 Wyoming

As with Minnesota and South Dakota, SEA contacted state and local government agencies and reviewed media information in Wyoming to identify any reasonably foreseeable projects that could result in cumulative impacts. Following is a summary of these reasonably foreseeable projects.

The North American Power Group has proposed to construct a new electrical power generation facility, the Two Elk power plant, a 250-megawatt electrical generation facility, near the Black Thunder mine east of Wright, Wyoming. The \$300 million power plant would require 350 workers and approximately three years to complete. It is designed to use coal fines, the small particles of coal lost during handling which are unmarketable, as a fuel source to generate electricity. Construction activities could begin as early as the summer of 2000. The town of Wright currently has a population of 1,556 people, which represents an increase of 400 people from 1998. The increase in population is attributed to growth in the nearby coal mines. The housing market in Wright is considered tight and there is little additional housing available. The public school system is small and near capacity. The potential of 350 people relocating to the area could impact the school system causing over enrollment and crowded classrooms. Impacts on public emergency services could occur from a sudden increase in population if it exceeds the current capacity. Air emissions could contribute to the overall reduction of air quality near the plant. Air emissions from the Two Elk Power Plant are included in SEA's air quality visibility analysis. See Chapter 4, Section 4.8. Construction of the power plant would result in a loss of grassland habitat. Wildlife that use this area would be expected to relocate to nearby suitable habitat. Vehicle traffic on local roadways would be expected to increase during construction of the power plant as well as during operation due to workers traveling to and from work, reducing road safety and increasing road wear, maintenance, and wildlife mortality.

Union Pacific Railroad Company (UP) has proposed to double-track its Powder River Basin rail line from South Morrill, Nebraska, to Shawnee, Wyoming. The \$60 million project would include approximately 37.0 miles of second rail line track, and 24 bridges. It would give UP over 106 miles of double track on their PRB rail line. Additionally, UP has proposed to increase capacity at the South Morrill, Nebraska yard. Construction of additional tracks within existing UP right-of-way would impact streams at crossings with increased TSS and disturbance during the placement of bridges and culverts. Construction would occur within the existing right-

of-way therefore, minimal habitat loss would be expected. Operation of an additional rail line could result in increased train traffic. An increase in rail traffic could result in increased noise, emissions, transportation and safety concerns at public grade crossings for communities along the rail line such as the community of Lusk, Wyoming.

Due to the increasing demand for low sulphur coal, the coal mines in the Powder River Basin are expected to continue to expand operation and production. The projected demand for coal is presented in Chapter 1, Purpose and Need, in Table 1-5. The increased demand for coal is supported by a recent study performed by CANAC Inc. under contract to UP and Burlington Northern Santa FE (BNSF) railroads. The study recommends that coal mines in the PRB add 20 new unit train staging areas. The study also recommends \$100 million in infrastructure improvements to the joint rail line between Gillette and Shawnee Junction, Wyoming over the next five years to meet the anticipated increase in demand for low sulfur PRB coal. Continued and increased mining of coal would likely increase the impacts of this activity on the environment.

Expansion of existing mines and creation of new mines would require the conversion of natural resource communities into an industrial use. Impacts to human and natural resources would include increased loss of soil to erosion, increased dust, alterations to surface water drainage and decrease in water quality, loss of wetlands, increased use of groundwater, loss of wildlife habitat, removal of native vegetation, disturbance to wildlife, and possible loss of cultural resources. However, mining and reclamation of mines has been ongoing in the PRB for over twenty years. All mining and reclamation activities are regulated by Federal and state statutes. Increased mining would be expected to create positive impacts to the local economy as coal mining is a major socioeconomic component of the PRB region. Transportation of coal at increasing levels could reduce air quality in the project area. All potential impacts to the natural and man-made environment from transporting coal in unit coal trains would continue, and potentially increase, as demand for low sulphur coal increases. As coal production continues to increase, rail service problems from the coal mines are expected increase. Existing rail providers in the PRB (UP and BNSF) would likely experience service problems at the mines, affecting the level of service they could provide their customers.

The nation's increased consumption of energy has driven the need to tap into non-coal energy resources in the PRB. Projects such as the LAK Oil Ranch Project near the town of Newcastle, Wyoming and coal bed methane (CBM) production in the PRB are expanding their operations to produce more fuels to meet the rising demand for energy. CBM operations exist in the PRB, and are expected to increase substantially. During construction of wells, local roadways are used to transport drilling rigs, earth-moving equipment, and personnel to the well sites. Unimproved two-track service roads are often developed to gain access to the proposed well sites and other well facilities. Construction of wells and facilities would require the use of many small

parcels of land. Impacts from construction would include loss of habitat to local wildlife species, disturbance from drilling activities and construction of pipelines to connect wells for operation. Increased noise and dust levels could occur during the drilling and construction portion of the project. However, utilization of local roadways for transportation of heavy equipment would decrease following the initial drilling and construction. Extracting methane from coal beds results in a draw down of groundwater. Removing groundwater at the site of a gas well can reduce the quality and quantity of groundwater resources outside the well area. Erosion and downcutting occurs in streams where ground water is discharged. Storage and treatment of large quantities of ground water extracted during pumping requires conversion of land to storage ponds. Emissions created from the construction and operation of a well facility contribute to local and possibly distant air quality. Methane-powered compressors, which pressurize CBM for transmission through pipelines, are a source of NO_x emissions which contributes to regional haze. Construction activities are a source of PM_{10} , while construction equipment and vehicles are a source of NO_x and SO_2 . However, their impacts are temporary and would cease following installation of the well. Existing emissions from coal bed methane facilities are included in the air modeling analysis in Chapter 4, Section 4.4.8. As with other previously mentioned proposed actions for the PRB, a lack of available housing in the region could present a problem for the anticipated workforce. Expansion of the CBM industry in the PRB region could cause local populations to increase which could place a strain on public services such as schools, hospitals, police, fire, and ambulance service.

5.3 SUMMARY OF CUMULATIVE IMPACTS

The following paragraphs summarize the impacts, both negative and positive, that would likely occur to the natural and human environment as a result of the construction and operation of the PRB Expansion project and other foreseeable actions near the project area. SEA's determination of the level and significance of impacts to these resources is based on the total effects of construction and operational activities occurring throughout the entire PRB Expansion Project area.

The cumulative loss of vegetation from the construction of previously identified projects would result in a loss of habitat for native wildlife. Land converted from agricultural use into industrial use decreases the amount available for production of crops and forage. However, the loss of relatively small parcels of farmland, such as the 50.0 acres purchased for the Mankato-Kasota Stone quarry, would have insignificant impacts, when considering the abundance of farmland available in the area. Wildlife that experience a loss of habitat as a result of the construction of the PRB Expansion Project could have a difficult time locating suitable habitat when other projects in the area are impacting the same type of habitat. This potential situation could occur in the project area near Mankato, Minnesota where the construction of the Mankato

South Route has impacted wildlife habitat such as crop fields, pastures, wetlands, and woodlands. These types of wildlife habitats are similar to what could be impacted from the construction of Alternative M-2 in the same area. However, like much of the PRB project area, the region south of Mankato is generally rural and undeveloped, therefore an adequate amount of suitable habitat is available to compensate for the loss of vegetative habitat. The total loss of wetlands from the PRB project and the other foreseeable projects would be significant. Reduction of functioning wetlands would result in losses such as habitat for wildlife, storm water retention, ground water recharge, and toxicant and sediment control. However, wetland mitigation would result in the replacement of impacted wetlands with wetlands of similar composition and function.

Continued expansion of coal mining, coal bed methane production, increased rail service, and construction of a power plant in the PRB would increase pollutant emissions. Dust and combustion emissions would contribute to an increase in and around the PRB region. Coal mining, coal bed methane production, and rail service are ongoing activities in the project area, in some cases for as long as twenty years. Emissions produced from these activities currently contribute to reduced air quality in the project area. Increased rail traffic would not only create additional emissions in the PRB, but along the entire length of the rail line. Emissions associated with projects in Minnesota, such as redistributed vehicle traffic on the Mankato South Route, and increased vehicle and air traffic associated with the Rochester International Airport would combine with those of the PRB Expansion Project.

The coal mines of the PRB are currently served by two major rail carriers, UP and BNSF. One of these carriers, UP, has proposed to expand its rail facilities serving the coal mines to allow for increased transportation of coal. The addition of a third rail carrier, such as DM&E, would create competition among current rail carriers. All rail carriers could be expected to expand their present operations and facilities to better compete with each other, while at the same time meeting the increasing demand for the region's coal.

Increased production of coal, expansion of rail services, and the construction and operation of new power generation facilities in the PRB would require additional workers to relocate in the region from outside the area. The anticipated increased demand for workers to construct and operate the proposed projects and the resulting increase in local population, could have significant impacts to the economies of towns in and near the PRB. In areas where rapid population growth could occur, such as the towns of Wright, Gillete, and Newcastle, Wyoming, public schools classrooms could experience over-crowding. A sudden increase in population could place an additional strain on public services such as law enforcement agencies and fire and rescue units. However, population growth in the PRB region would also provide opportunities for expansion of local businesses and additional economic growth. Demand for housing, both temporary and permanent, would provide increased work for local contractors and potentially

increase real estate values. Merchants and business owners could expect an increase in sales and business, resulting in increased profits. Growth would provide additional revenues for the counties which could be used to address short falls in public services.

Increased development activity in the PRB would create increased numbers of people locating to the area. As the human population in the area increases, demand for services and facilities to provide for their basic needs would also increase. Transportation facilities such as roadways and rail lines would experience increased use in order to facilitate movement of people and products into the region. Many of these transportation corridors would require upgrades to meet the demands of a growing population. DM&E's proposed upgrades and expansion into the PRB would be a compatible component of this growth.

The affects of the PRB Expansion Project on the natural and human environment would combine with those of other reasonably foreseeable future projects and create significant impacts to such resources as wetlands, cultural resources, paleontological resources, soils, and vegetation. Impacts from the construction and operation of these projects could also combine to cause significant impacts to safety. Increased industrial growth throughout the project area, particularly in the PRB region would deliver significant, positive impacts to the local economy of the region both in the short and long term. Coal mining and other energy production industries currently represent a major portion of the economic base for the PRB region. Expansion of these projects and those that support them, such as rail service, could have a large influence on future growth in this region.

Improvements to the existing DM&E rail line could have a positive effect on the grain fuel (Ethanol) industry. Improvement and extension of a rail spur that serves Heartland Grain Fuels and Farmland Industries in Huron, South Dakota would be complemented by the reconstruction of the existing DM&E rail line. DM&E's rail line passes through Huron, and Heartland Grain Fuels and Farmland Industries are current customers of the DM&E Railroad. Improvements to the existing rail line would enable DM&E to provide faster, more efficient service to industries such as Heartland Grain Fuels, making ethanol more competitive in the market place.

Tables 5.3-1, 5.3-2, and 5.3-3, located at the end of this chapter, provide a summary of the nature (significant versus insignificant; long-term versus temporary; beneficial versus adverse) of the potential impacts from the different alternatives of the PRB Expansion Project and the various types of other reasonably foreseeable projects anticipated in the project area. These tables present the potential level of impact to the natural and human environment anticipated to occur to as a result of the proposed PRB Expansion Project in each of the three projects areas, combined with the reasonably foreseeable projects occurring in the same project area as described in Section 5.2. These summary tables are divided by similar geographic regions and are labeled

Minnesota Projects Table 5.3-1, Eastern South Dakota Projects Table 5.3-2, and Western South Dakota/Wyoming New Construction Projects Table 5.3-3. The level of impact to a particular resource due to the PRB Expansion Project may not be the same as the cumulative level of impact. These tables are intended to provide an “at a glance” summary of the cumulative impacts.

SEA developed standards to describe the level of impact that the PRB Expansion Project and the reasonably foreseeable projects would have on the natural and human environment ranging from No-Impact to Significant Long-term Adverse impacts. Within the range of impacts are varying combinations of significance, length of impact, and level of severity. In the Minnesota project area, the majority of the environmental resources would experience Minor, Long-term, Adverse (MLA) impacts. This categorization indicates that each of these resources would be adversely impacted for a long period of time at a level not considered significant, but beyond what is currently experienced. For instance, agricultural land would be affected at an MLA level. Based on the large acreage of agricultural land available in Minnesota, the amount of land which would be affected by the various projects is not considered significant. However, adverse impacts to agricultural land would result from these projects, and the impacts could occur over a long period of time.

The only environmental resource in Minnesota that SEA has determined would experience Significant Long-term Adverse impacts would be noise sensitive and vibration receptors. This is a result of the populated areas in which the existing DM&E rail line currently operates. On the other hand, the Socioeconomics of the Minnesota project area would experience Significant Long-term Positive impacts based on an increase in employment, tax revenues, and economic growth

The natural and human environment in the Eastern South Dakota and the Western South Dakota/Wyoming project areas would be affected by the PRB Expansion Project and the other reasonably foreseeable projects comparably to the Minnesota project area. The majority of resources which were analyzed would fall into the category of MLA. However, unlike Minnesota, these two project areas would not have significant impacts as a result of noise and vibration. This difference is due to the low numbers of noise sensitive and vibration receptors near the project areas. Adverse visibility impacts to Class I air sheds (Badlands National Park, Sage Creek Wilderness Area, and Wind Cave National Park) would occur at the 50 MET and 100 MET levels. Badlands National Park would experience significant visibility impacts at the 100 MET operating level under Extension Alternative D. The Eastern South Dakota project area would experience Significant Long-term Adverse impacts to safety resulting from the high number of crossings on the existing DM&E rail line that would experience decreased safety at higher operational levels. Both project areas would experience Significant Long-term Positive socioeconomic impacts as a result of an increase in jobs, tax revenues, and economic growth

created by the PRB Expansion Project, and the other reasonably foreseeable projects. Significant Long-term Adverse impacts to threatened and endangered species would result from Extension Alternative B. Alternative B has the greatest amount of alignment within 500 feet of the Cheyenne River and therefore a greater potential for impact on interior least tern, and piping plover habitat. No other project component is expected to have significant impacts to threatened or endangered species. Should project activities have an affect on previously unidentified threatened or endangered species, project activities would cease until contact would be made with the U.S. Fish and Wildlife Service (USWS) to coordinate efforts to prevent impact to the species.

Steps to reduce the impacts to human and natural resources resulting from the PRB Expansion Project are addressed in Chapter 7. However, mitigation for impacts resulting from any past, present, and reasonably foreseeable projects would be the responsibility of the agency or organization in charge of that project and are not presented in this Draft EIS.

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Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
	Operation	Operation	Operation
GEOLOGY			
Unique Geological Formations	Lance Formation in project area.	No impacts expected.	No impacts expected.
Geological Hazards	Potential for slumping and landsliding in susceptible areas. Cheyenne River slope reshaping and river bank stabilization.	Potential for landslides confined to steep slopes of Pierre Shale and Fort Union formations adjacent to the Cheyenne River, approximately 1,978.2 acres.	Potential for landslides confined to steep slopes of Pierre Shale and Fort Union formations adjacent to the Cheyenne River, approximately 50.9 acres.
Soil Impacts	Approximately 12,887.3 acres of soil converted to rail line right-of-way due to new build and approximately 194 acres parallel to an existing rail line. Disturbance could result in erosion, soil compaction, and soil loss. Conversion of approximately 1,013.3 acres of prime farmland to rail line right-of-way.	Approximately 12,790.3 acres of soil converted to rail line right-of-way due to new build and approximately 194 acres parallel to an existing rail line. Disturbance could result in erosion, soil compaction, and soil loss. Conversion of approximately 1,071.5 acres of prime farmland to rail line right-of-way.	Approximately 5,653.3 acres of soil converted to rail line right-of-way due to new build and approximately 3,047 acres parallel to an existing rail line. Disturbance could result in erosion, soil compaction, and soil loss. Conversion of approximately 935.7 acres of prime farmland to rail line right-of-way.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
Paleontological Resources	<p>Approximately 1,061.8 acres of PFYC rating 5 formations, including 96.9 acres of Thunder Basin SIA, and approximately 11,180.6 acres of PFYC rating 3 formations included in right-of-way. Resources and scientific information may be acquired due to project construction activity. Possible loss of resources on private lands and inadvertent destruction of resources project wide.</p>	<p>Approximately 1,837.6 acres of PFYC rating 5 formations, including 116.4 acres of Thunder Basin SIA, and approximately 10,176.9 acres of PFYC rating 3 formations included in right-of-way. Resources and scientific information may be acquired due to project construction activity. Possible loss of resources on private lands and inadvertent destruction of resources project wide.</p>	<p>Approximately 2,664.2 acres of PFYC rating 5 formations would be crossed and approximately 4,589.1 acres of PFYC rating 3 formations included in right-of-way. The Thunder Basin SIA would not be crossed. Possible loss of resources on private lands and inadvertent destruction of resources project wide.</p>
	Operation	Operation	Operation
	No impacts expected.	No impacts expected.	No impacts expected.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D		
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.		
Action	Construction	Construction	Construction		
	Operation	Operation	Operation		
LAND USE					
Agriculture	Approximately 231.6 miles, 11,229.1 acres, of rangeland converted to railroad right-of-way. 79 Forest Service and 10 BLM allotments affected, resulting in the disturbance of approximately 2,707.3 acres and the loss of 563.7 AUMs. Loss of 1,149.0 acres of cropland. Isolation of water sources, disruption of operations, reduced access to pastures. Livestock displacement, damage to improvements such as ditches, fences, and water lines which cross or are adjacent to the proposed rail line. Livestock mortality due to collision with vehicles.	Reduced access and inconvenience to farmers and ranchers. Livestock mortality or injury. Potential loss of vegetation due to fire.	Approximately 207.0 miles, 9,568.9 acres, of rangeland converted to railroad right-of-way. 56 Forest Service and 10 BLM allotments affected. Approximately 2,520.0 acres would be disturbed, resulting in the loss of 491.2 AUMs. Loss of 1,323.6 acres of cropland. Impacts would be similar to those presented for Alternative B.	Approximately 264.5 miles, 6,412.0 acres, of rangeland converted to railroad right-of-way. 38 Forest Service and 9 BLM allotments or allotment pastures affected. Approximately 1,320.0 acres disturbed, resulting in the loss of 238.1 AUMs. Loss of 1,229.0 acres of cropland. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Residential	Approximately 14.5 acres of residential land would be converted to rail line right-of-way. Two residences, located within 500 feet of the proposed rail line may require relocation. Increased noise, dust, traffic congestion, and reduced safety. Inconvenience due to ground disturbance. Vehicle delays.	Noise disturbance due to rail traffic. Vehicle delays. Adjacent properties may be affected by vibrations.	Approximately 14.5 acres of residential land would be converted to rail line right-of-way. Eight residences located within 500 feet of the proposed rail line may require relocation. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Approximately 143.0 acres of residential land would be converted to rail line right-of-way. 916 residences are located within 500 feet of the proposed rail line. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Business and Industrial	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	Approximately 18.1 acres of business and industrial land converted to rail line right-of-way. Increased noise, dust, and vehicle delays. Detours and traffic congestion. Inconvenience and reduced access for patrons and employees.	Increased noise, vehicle delays, and potential reduction in patronage. Rail service to businesses and competition in the marketplace are expected to improve. Opportunities for rail service provided in new areas.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
Minerals and Mining	Market for local materials. Approximately 1.2 miles crossed.	Market for local materials. No land crossed.	Market for local materials. Approximately 1.9 miles crossed.
	Operation	Operation	Operation
	Additional rail access to PRB mines.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
	Operation	Operation	Operation
FEDERAL LANDS			
Forest Service Lands	51.9 miles of USFS land crossed. Approximately 2,516.4 acres converted to rail line right-of-way. Noise and visual disturbance in areas along the Cheyenne River would degrade the recreational experience in proximity to the proposed rail line. Crossing of 3 ROS areas.	Noise and visual disturbance in areas along the Cheyenne River would degrade the recreational experience in proximity to the proposed rail line. Some of the Red Shirt and Cheyenne River RARE II Areas could be eliminated from future consideration for inclusion in the National Wilderness System. In range allotment, disruption of livestock movement and the spread of noxious weeds could occur. Livestock mortality or injury due to collision.	38.9 miles of USFS land crossed. Approximately 1,886.1 acres converted to rail line right-of-way. Semi-primitive motorized ROS designated lands would be crossed in the Spring Creek drainage. Noise and visual disturbance would degrade recreational experience in proximity to the proposed rail line.
	Noise impacts would degrade the wilderness qualities of the Red Shirt RARE II area and exclude it from consideration from inclusion in the National Wilderness System.	Noise impacts would degrade the wilderness qualities of the Red Shirt RARE II area and exclude it from consideration from inclusion in the National Wilderness System.	26.7 miles of USFS land crossed. Approximately 647.3 acres converted to rail line right-of-way. Impacts similar to those presented for Alternative B. No ROS areas would be crossed.
	Noise and visual disturbance in proximity to the proposed rail line.		

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

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Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
	Operation	Operation	Operation
WATER RESOURCES			
Surface Water	20 perennial streams and 623 intermittent streams crossed. 21.9 miles within 500 feet of Cheyenne River. Stream bank modification and channelization, changing hydrology. Vegetation removal, erosion, increased sedimentation and degraded water quality. Potential loss of habitat for some species.	Contamination due to accidental spill or derailment.	14 perennial streams and 520 intermittent streams crossed. 20.8 miles within 500 feet of the Cheyenne River. Impacts would be similar to those presented for Alternative B.
		Impacts would be similar to those presented for Alternative B.	68 perennial streams and 707 intermittent streams crossed; 237 crossed by the existing rail line, 538 crossed by new construction. 13.5 miles within 500 feet of the Cheyenne River. Impacts would be similar to those presented for Alternatives B.
		Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Wetlands	Loss of approximately 62.1 acres of wetlands including: approximately 33.2 acres of emergent; 16.5 acres of aquatic bed; 8.7 acres of unconsolidated bottom; 3.7 acres of scrub/shrub; and forested. Adjacent wetlands may experience sedimentation, changes in hydrology, disturbance by construction equipment and vehicles.	Permanent loss of adjacent wetlands could result due to changes in hydrology. Possible reestablishment of wetlands in some areas.	Loss of approximately 62.2 acres of wetlands: approximately 39.2 acres of emergent; 18.9 acres of aquatic bed; 2.9 acres of unconsolidated bottom; 1.2 acres of scrub/shrub and forested. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Approximately 40.7 acres of wetlands would be lost: 26.4 acres of emergent; 11.0 acres of aquatic bed; 2.6 of unconsolidated bottom; and 0.7 acres of scrub/shrub or forested. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Groundwater	Potential contamination in the unlikely event of an accidental spill.	Potential contamination in the unlikely event of an accidental spill or derailment.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction		Operation		Construction	Operation
AIR QUALITY						
Air Quality	Temporary increase of fugitive dust, and emissions from construction equipment and delayed vehicles.	Emissions levels for NO _x would exceed thresholds in 4 counties at 20 MNT; NO _x in all counties and CO in 2 counties at 50 MNT; and NO _x in all counties, HC in one county, CO in 4 counties and SO ₂ in 3 counties at 100 MNT. 0 visual impairment days would occur for > 5% and >10% at 20MNT, 5 days at >5% and 0 days at >10% at 50 MNT, and 36 days at >5% and 5 days at >10% at 100 MNT.	Impacts would be similar to those presented for Alternative B.	Emissions levels of NO _x would exceed thresholds in 4 counties at 20 MNT; NO _x in all counties and CO in one county at 50 MNT; and NO _x in all counties, CO in 4 counties, and SO ₂ in 2 counties at 100 MNT. 0 visual impairment days would occur for >5% and >10% at 20MNT, 4 days at >5% and 0 days at >10% at 50 MNT, and 31 days at >5% and 4 days at >10% at 100 MNT.	Impacts would be similar to those presented for Alternative B.	Emissions levels for NO _x exceeded in 5 counties at 20 MNT; NO _x in all counties, CO in 4 counties, and SO ₂ in 2 counties at 50 MNT; NO _x in all counties, HC in 4 counties, CO in 5 counties and SO ₂ in 4 counties at 100 MNT. 1 visual impairment days would occur for >5% and 0 days at >10% at 20MNT, 24 days at >5% and 1 day at >10% at 50 MNT, and 78 days at >5% and 20 days at >10% at 100 MNT.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Operation	Operation
NOISE AND VIBRATION			
Noise	<p>Increased noise from construction activities.</p> <p>Noise receptors at 65 dBA: 20 MNT Wayside - 1 Wayside/Horn - 1 Horn - 24</p> <p>50 MNT Wayside - 3 Wayside/Horn - 2 Horn - 44</p> <p>100 MNT Wayside - 5 Wayside/Horn - 10 Horn - 60</p> <p>70 dBA: 20 MNT Wayside - 0 Wayside/Horn - 1 Horn - 12</p> <p>50 MNT Wayside - 1 Wayside/Horn - 2 Horn - 19</p> <p>100 MNT Wayside - 1 Wayside/Horn - 3 Horn - 33</p>	<p>Impacts would be similar to those presented for Alternative B.</p> <p>Noise receptors at 65 dBA: 20 MNT Wayside - 1 Wayside/Horn - 2 Horn - 9</p> <p>50 MNT Wayside - 2 Wayside/Horn - 4 Horn - 15</p> <p>100 MNT Wayside - 7 Wayside/Horn - 7 Horn - 16</p> <p>70 dBA: 20 MNT Wayside - 0 Wayside/Horn - 0 Horn - 7</p> <p>50 MNT Wayside - 1 Wayside/Horn - 3 Horn - 8</p> <p>100 MNT Wayside - 1 Wayside/Horn - 4 Horn - 13</p>	<p>Impacts would be similar to those presented for Alternative B.</p> <p>Increase of noise receptors at 65 dBA: 20 MNT Wayside - 12 Wayside/Horn - 228 Horn - 1,187</p> <p>50 MNT Wayside - 29 Wayside/Horn - 358 Horn - 2,008</p> <p>100 MNT Wayside - 75 Wayside/Horn - 624 Horn - 2,587</p> <p>70 dBA: 20 MNT Wayside - 2 Wayside/Horn - 57 Horn - 524</p> <p>50 MNT Wayside - 11 Wayside/Horn - 143 Horn - 1,088</p> <p>100 MNT Wayside - 18 Wayside/Horn - 260 Horn - 1,849</p>

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
Vibration	Minor vibrations may be experienced during construction activities.	Potential damage to one house located within 101-200 feet of the proposed rail line and inconvenience to one house within 201-400 feet of the rail line.	Damage to 2 houses located between 0-100 feet of the proposed rail line, potential damage to 2 houses between 101-200 feet, and inconvenience to 3 houses between 201-400 feet.
	Operation	Operation	Operation
	Minor vibrations may be experienced during construction activities.	Potential damage to one house located within 101-200 feet of the proposed rail line and inconvenience to one house within 201-400 feet of the rail line.	Damage to 3 houses located between 0-100 feet of the proposed rail line, potential damage to 11 houses between 101-200 feet, and inconvenience to 61 houses between 201-400 feet.
BIOLOGICAL RESOURCES			
Vegetation	Loss of approximately: 10,686.1 acres of grasslands, 1,153.9 acres of cropland and pasture, 106.7 acres of coniferous woodlands, 24.2 acres deciduous woodlands, 707.9 acres of big sagebrush shrublands, and 62.1 acres of wetlands. Possible minimal vegetation disturbance in adjacent areas.	Noxious weeds may become established in disturbed areas. Use of herbicides could damage adjacent vegetation. Mowing and trimming may be required to control ground cover. Potential loss due to fire.	Loss of approximately: 10,521.2 acres of grasslands, 1,318.8 acres of cropland or pasture, 33.9 acres of deciduous woodlands, 145.4 acres of coniferous woodlands, 547.9 acres of big sagebrush shrublands, and 62.2 acres of wetlands. Impacts would be similar to those presented for Alternative B.
		Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
		Loss of approximately: 4,557.6 acres of grasslands, 1,236.4 acres of cropland or pasture, 12.1 acres of deciduous forest, 225.4 acres of coniferous forest, 1,956.4 acres of big sagebrush shrublands, and 40.7 acres of wetlands. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Operation	Construction
WILDLIFE			
Big Game	Disturbance from noise and human activity along approximately 336.6 miles of yearlong range, 16,320 acres, and loss of habitat. Approximately 94.1 miles, 4,562.4 acres, of winter range converted to rail line right-of-way. Mortality and injury may increase due to hunting, poaching, and collisions with vehicles.	Fencing may impede seasonal migration and reduce access to water. Noise disturbance during high-stress periods. Mortality from collisions with trains.	Approximately 293.7 miles of yearlong range, 14,240.0 acres, would be crossed. Approximately 81.9 miles, 3,970.9 acres, of winter range converted to rail line right-of-way. Impacts would be similar to those presented for Alternative B.

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Waterfowl and Shorebirds	11,840.0 acres of potential nesting habitat and 62.1 acres of wetland habitat lost. Disturbance from noise and human activity during nesting. Habitat loss, wetland loss, and nest loss. Habitat degradation from accidental spills.	Noise disturbance and habitat abandonment. Mortality due to train/bird collisions.	11,840 acres of potential nesting habitat and 62.2 acres of wetland habitat lost. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	5,794.0 acres of potential nesting habitat and 40.7 acres of wetland habitat lost. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Small Game and Furbearers	Habitat disruption, disturbance from noise and human activity. Loss of food resources in the event of an accidental spill. Mortality and injury due to vehicle movements or accidental release of petroleum products.	Mortality from collision with trains. Reduced access to habitat.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
	Operation	Operation	Operation
Non-Game Species			
Amphibians and Reptiles	Loss of habitat, displacement from proposed right-of-way, and mortality. 19.1 miles within 500 feet of a perennial stream.	Mortality from train operations. Some individuals would return to right-of-way during operation.	Impacts would be similar to those presented for Alternative B. 20.8 miles within 500 feet of a perennial stream.
Songbirds	Loss of habitat, particularly 106.7 acres of woodlands, 707.9 acres of shrubland, and 7.8 acres of shrub/scrub and forested wetlands. Potential disturbance to adjacent habitat. Loss of nests.	Revegetation would provide habitat for some species. Noise disturbance. Mortality due to collision with trains.	Impacts would be similar to those presented for Alternative B. 13.5 miles within 500 feet of a perennial stream.
Raptors	Loss of 130.9 acres of woodlands. 83 nests and 85.0 miles of potential nesting habitat within 0.5 miles. Potential nest abandonment due to noise and human disturbance. Loss of habitat.	Disturbance during nesting periods due to noise impacts and human activities. Mortality due to collision with trains.	Loss of 237.5 acres of woodlands. 77 nests and 29.9 miles of potential nesting habitat within 0.5 miles. Impacts would be similar to those presented for Alternative B.

<p>Table 5.1-1 Summary of Environmental Impacts: South Dakota and Wyoming New Construction</p>						
Alternative	Alternative B	Alternative C	Alternative D			
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.			
Action	Construction	Operation	Construction	Operation	Construction	Operation
AQUATIC AND FISHERIES						
Aquatic and Fisheries	177 sites within 500 feet of perennial waterways. 20 perennial streams and 623 intermittent streams crossed. Sedimentation, erosion, and accidental release of toxic substances could cause loss of habitat and degrade water quality.	Potential contamination due to the accidental release of toxic substances or derailment.	206 sites within 500 feet of perennial waterways. 14 perennial and 520 intermittent streams crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	76 sites within 500 feet of perennial waterways. 68 perennial and 707 intermittent streams crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Sensitive, Threatened and Endangered Species						
Black-footed Ferret	Approximately 4.9 miles of prairie dog towns (potential black-footed ferret habitat) near Rosecrans Reintroduction Area on TBNG would be crossed. Loss of potential habitat.	Disruption and division of potential habitat area would make proposed reintroduction area unsuitable for habitat.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Piping Plover and Interior Least Tern	112.0 miles within 1.0 mile of a perennial stream. 20 perennial and 623 intermittent streams crossed. Displacement of nesting plovers and terns and nest abandonment due to noise disturbance and increased human activity. Accidental spills could cause contamination of waters and loss of food resources.	Potential nest abandonment by due to noise disturbance and human activity. Accidental spills could cause contamination of waters and loss of food resources	81.0 miles within 1.0 mile of a perennial stream. 14 perennial and 520 intermittent streams crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	46.0 miles within 1.0 mile of a perennial stream. 68 perennial and 707 intermittent streams crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
American Burying Beetle	1,570.9 acres of potential habitat converted to rail line right-of-way. Habitat may be disturbed or lost. Mortality during construction may occur. Artificial construction lights may attract beetles resulting in disorientation and mortality.	Lighting of permanent facilities may attract beetles resulting in disorientation and mortality.	1,663.0 acres of potential habitat converted to rail line right-of-way. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	955.1 acres of potential habitat converted to rail line right-of-way. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
Ute Ladies' -tresses Orchid	Loss of approximately 33.2 acres of potential habitat.	Loss of approximately 39.2 acres of potential habitat.	Loss of approximately 26.4 acres of potential habitat.
	Operation	Operation	Operation
	Introduction of noxious weeds and herbicide use may eliminate or reduce existing populations.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Bald Eagle	78.5 miles within 0.5 miles of winter habitat. Human activity, operation of machinery, and noise disturbance may cause habitat abandonment. Removal of trees could cause loss of roosting areas.	57.4 miles within 0.5 miles of winter habitat. Impacts would be similar to those presented for Alternative B.	29.9 miles within 0.5 miles of winter habitat. Impacts would be similar to those presented for Alternative B.
Mountain Plover	5,052.1 acres of grasslands and 87.3 acres of prairie dog colonies converted to rail line right-of-way. Potential mortality due to vehicle operation. Noise disturbance may cause habitat abandonment. Nests may be lost during construction activities.	5,173.3 acres of grasslands and 53.3 acres of prairie dog colonies converted to right-of-way. Impacts would be similar to those presented for Alternative B.	2,889.6 acres of grassland and 14.5 acres of prairie dog colonies converted to rail line right-of-way. Impacts would be similar to those presented for Alternative B.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Swift Fox	Noise disturbance and habitat loss along 11.4 miles of prairie dog colonies. Mortality due to collision with vehicles. Clearing may reduce available food resources.	Mortality due to collision with trains.	16.9 miles of prairie dog colonies crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	6.2 miles of prairie dog colonies crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Sturgeon Chub	Three crossings of the Cheyenne River causing increased sedimentation during stream bank stabilization. Accidental spills may cause contamination of waterways.	Accidental spills or derailment could cause contamination of waterways.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Black-tailed Prairie Dog	552.7 acres of habitat crossed. Fragmentation of prairie dog towns would prevent use as reintroduction area, mortality due to construction activities, recreational shooting, and collision with vehicles.	Potential mortality due to collisions with trains. Increased predation and disease due to increased predator presence.	819.4 acres of habitat crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	150.3 acres of habitat crossed. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B		Alternative C		Alternative D	
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
TRANSPORTATION						
Transportation	44 new grade crossings. Increased traffic, reduced access, and congestion on roadways. Accelerated wear and tear on local roadways.	No roadways with ADTs greater than 5000. Potential delay of emergency vehicles. Vehicle delays at grade crossings. Provide shorter routing for train transport of PRB coal.	45 new grade crossings. Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	10 new grade crossings and 98 existing crossings. 3 crossings with ADTs over 5000. Impacts would be similar to those presented for Alternative B.	Reduced delay per stopped vehicle. Increased frequency of vehicle delays at grade crossings. Improved rail service on existing rail line. No level of service over the level of B.
SAFETY						
Safety	Vehicle delays, congestion at grade crossings, and increased construction related traffic may increase accidents.	4 crossings would be Category A. All other crossings would be Category B. Significantly impacted crossings: Old US 18 (Fall River County) at 100 MNT; US HWY 85 (Niobrara County) at 50 and 100 MNT; Hwy 450 (Campbell County) at 20 , 50, and 100 MNT; and Bishop Road (Campbell County) at 50 MNT and 100 MNT.	Traffic delays and congestion may cause increased safety concerns.	3 crossings would be Category A. All other crossings would be Category B. Significantly impacted crossings: US HWY 85 (Niobrara County) at 50 and 100 MNT; Bishop Road (Campbell County) at 50 and 100 MNT; WT 450 (Campbell County) at 100 MNT.	Vehicle delays and congestion may cause increased safety concerns.	Significant impacts would occur in at 2 crossings for 20 MNT; 13 crossings at 50 MNT; and 22 crossings under 100 MNT.

<p align="center">Table 5.1-1 Summary of Environmental Impacts: South Dakota and Wyoming New Construction</p>						
Alternative	Alternative B	Alternative C	Alternative D			
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.			
Action	Construction	Operation	Construction	Operation	Construction	Operation
HAZARDOUS MATERIALS						
Transportation of Hazardous Materials	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	Improved condition of existing rail line would reduce the likelihood of an accident.
Hazardous Waste Sites	Disturbance of sites may cause exposure to contamination.	Potential contamination in the event of a spill, derailment, or as a result of improper handling and storage of hazardous materials.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
ENERGY RESOURCES						
Transportation of Energy Resources	Length of alternative would be 265.8 miles. No impacts expected.	Transportation of PRB coal would be more economical, reliable, and efficient.	Length of alternative would be 263.8 miles. No impacts expected.	Impacts would be similar to those presented for Alternative B.	Length of alternative would be 353.4 miles. Minor delays or rerouting in construction areas.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C		Alternative D	
Length	265.8 miles of new construction.	263.8 miles of new construction.		233.2 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction
Utilization of Energy Resources	Fuel consumption could be increased due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.	Fuel savings and improved utilization of coal resources. Three locomotives per train. Several hundred mile reduction to target markets.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Recyclable Commodities	Use of used rail, ties, and ballast materials during construction.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.
					Improved utilization of coal resources. Five locomotives per train.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B		Alternative C		Alternative D			
Length	265.8 miles of new construction.		263.8 miles of new construction.		233.2 miles of new construction.			
Action	Construction		Operation		Construction		Operation	
CULTURAL RESOURCES								
Cultural Resources	77 archaeological sites within 1.0 mile, 6 potentially eligible for the National Register. One site within the proposed right-of-way in South Dakota. 240 sites and 44 isolated finds within one mile of the proposed right-of-way in Wyoming; 26 recorded archaeological sites are within the proposed right-of-way, 3 are eligible for listing on the National Register. Significant, high probability of additional unknown sites. Resources within right-of-way recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.		Noise and visual presence of rail line may alter setting and character of traditional cultural properties.		96 sites located within one mile of the proposed right-of-way in South Dakota; 52 sites within the proposed right-of-way. 312 sites are located within 1.0 mile of the proposed right-of-way in Wyoming; 25 sites are within the proposed right-of-way, three of which are National Register sites. Impacts would be similar to those presented for Alternative B.		Impacts would be similar to those presented for Alternative B.	
					Impacts would be similar to those presented for Alternative B.		37 sites estimated, 3 are known, within or adjacent to the proposed right-of-way, none of which are eligible for National Register in South Dakota. 229 sites and 59 isolated finds are located within one mile of the proposed alignment; 36 sites within the proposed right-of-way, 5 of which are eligible, and one listed on the National Register. Impacts would be similar to those presented for Alternative B.	

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Operation	Construction
SOCIOECONOMICS			
Population and Demographics	Short-term increases.	Small number of relocations due to employment opportunities.	Impacts would be similar to those presented for Alternative B.
Employment and Income	Over 900 construction jobs. Approximately 384 indirect jobs. Estimated construction earnings of \$125.4 million.	Over 100 high paying railroad jobs. Local unemployment decrease.	Impacts would be similar to those presented for Alternative B.
Public Service and Fiscal Condition	Increased tax revenue. Sales and use taxes from worker salaries and spending increase of approximately \$14.9 million	Property taxes could total an estimated \$9.4 million. Public services could be improved.	Impacts would be similar to those presented for Alternative B.

Table 5.1-1

**Summary of Environmental Impacts:
South Dakota and Wyoming New Construction**

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
	Operation	Operation	Operation
RECREATION			
Recreation	51.9 miles of USFS, 5.7 miles of BLM, and 10.1 miles of State lands crossed. Negative impacts due to noise, construction activity, dust, and increased traffic. Enjoyment of the recreational experience and overall solitude in wilderness areas reduced. Safety in proximity to the rail line reduced.	Increased noise and haze in scenic areas. Reduced revenue at parks and local communities could result from decreased recreational use.	38.9 miles of USFS, 4.9 miles of BLM, and 11.7 miles of State lands crossed. Impacts would be similar to those presented for Alternative B.
		Impacts would be similar to those presented for Alternative B.	26.7 miles of USFS, 3.0 miles of BLM, and 10.8 miles of State lands crossed. Impacts would be similar to those presented for Alternative B.
		Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
AESTHETICS			
Viewsheds/ Scenic Values	Significant impact to VQO designated areas due to ground disturbance, clearing of vegetation, and the presence of large machinery.	11.6 miles of VQO of modification and 2.6 miles of VQO of partial retention in the BGNG, 30.7 miles of VQO of modification and 4.9 miles of VQO of partial retention in the TBNG crossed. Reduced visibility due to air pollution.	Impacts would be similar to those presented for Alternative B.
		5.2 miles of VQO of modification and 0.7 VQO of partial retention in the BGNG, 28.4 miles of VQO of modification and 4.4 miles of VQO of partial retention in the TBNG crossed. Reduced visibility due to air pollution.	22.7 miles of VQO of modification and 4.0 miles of VQO of partial retention in the TBNG crossed. Reduced visibility due to air pollution.

Table 5.1-1
Summary of Environmental Impacts:
South Dakota and Wyoming New Construction

Alternative	Alternative B	Alternative C	Alternative D
Length	265.8 miles of new construction.	263.8 miles of new construction.	233.2 miles of new construction.
Action	Construction	Construction	Construction
Nightlights	Potential reduction of the perception of solitude and vastness along entire route due to nightlights.	Reduction of perception of solitude and vastness along entire route due to permanent facility lighting and locomotive headlights.	Impacts would be similar to those presented for Alternative B.
		Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
			Operation
		Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
			Operation
			Impacts would be similar to those presented for Alternative B.

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length	8.5 miles of new construction		10.3 miles of new construction		
Action	Construction	Operation	Construction	Operation	
GEOLOGY					
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	
Geological Hazards	Approximately 2.6 to 3.1 miles of Pierre Shale and Fort Union formations crossed. Approximately 126-150 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility would be high in areas containing steep slopes and along the Cheyenne River.	Approximately 1.7 miles of Pierre Shale and Fort Union formations crossed. Approximately 82 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility would be high in areas containing steep slopes and along the Cheyenne River.	
Soil Impacts	Disturbance of 412.1 acres of soil. Loss of topsoil, sedimentation, and erosion. Accidental spills could cause contamination of soils. No prime farmland lost for Alt. B, 14.5 acres of prime farmland lost for Alt. C.	Contamination could occur in the unlikely event of an accidental spill or derailment.	Disturbance of 499.4 acres of soil. Loss of topsoil, sedimentation, and erosion. Accidental spills could cause contamination of soils. Approximately 174.5 acres of prime farmland lost.	Impacts would be similar to those presented for Spring Creek.	

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Table 5.1-2 Summary of Environmental Impacts: Spring Creek Alternatives				
Alternative	Spring Creek		Phiney Flats	
Length	8.5 miles of new construction		10.3 miles of new construction	
Action	Construction	Operation	Construction	Operation
Paleontological Resources	Approximately 73-160 acres of PFYC rating 5 formations and up to approximately 336 acres of PFYC rating 3 formations converted to rail line right-of-way. Any resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.	Approximately 247 acres of PFYC rating 5 formations would be crossed and converted to rail line right-of-way. Any resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.
LAND USE				
Agriculture	Approximately 383-412 acres of rangeland lost. Up to 29.1 acres of cropland lost. Loss of forage, fragmentation of allotments, isolation of water resources and disruption of operations.	Allotment disturbance of approximately 0-52 acres resulting in the loss of 0-16 AUMs. Reduced access, loss of forage, and decreased range use.	Approximately 223.0 acres of rangeland lost. 276 acres of cropland lost. Loss of forage, fragmentation of allotments, isolation of water resources, and disruption of operations.	No grazing allotment would be affected. Reduced access, loss of forage, and decreased range use.
Residential	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Business and Industrial	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Minerals and Mining	May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.	May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.

**Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives**

Alternative		Spring Creek		Phiney Flats	
Length		8.5 miles of new construction		10.3 miles of new construction	
Action		Construction	Operation	Construction	Operation
Public Facilities		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
FEDERAL LANDS					
Forest Service Lands		Loss of 67.9 acres of semi-primitive motorized ROS lands along Alt. B.	Use incompatible with designation. Land degraded to lower designation.	No impacts expected.	No impacts expected.
Bureau of Land Management		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Bureau of Reclamation		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Fish and Wildlife Service Lands		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Reservation and Treaty Lands		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length		8.5 miles of new construction		10.3 miles of new construction	
Action		Construction	Operation	Construction	Operation
WATER RESOURCES					
Surface Water	16-26 perennial streams and 23-44 intermittent streams crossed. Stream bank modifications, channelization, potential stream flow increases, and decreased water quality. Sedimentation, increased erosion, TSS increase, and loss of habitat and food resources. Changes in drainage patterns and water availability.	Potential contamination in the event of an accidental spill or derailment.	One perennial stream and 13 intermittent streams crossed. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.	
Wetlands	Conversion of approximately 9.7 acres of forested wetlands could occur during construction of the rail line right-of-way. Sedimentation and changes in hydrology could affect adjacent wetland areas.	Reestablishment of wetlands could occur in some areas along the proposed rail line right-of-way. Changes in hydrology could affect adjacent wetland areas.	Approximately 1.0 acres of emergent wetland would be converted to rail line right-of-way. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.	
Groundwater	Potential contamination could occur in the unlikely event of an accidental spill.	Potential contamination could occur in the unlikely event of an accidental spill or derailment.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.	

**Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives**

Alternative		Spring Creek		Phiney Flats	
Length		8.5 miles of new construction		10.3 miles of new construction	
Action		Construction		Operation	
AIR QUALITY					
Air Quality		Temporary reduction in local air quality due to construction equipment and traffic delays.	Emissions levels for NO _x would exceed thresholds at 50 MNT and 100 MNT operation levels.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
NOISE AND VIBRATION					
Noise		Temporary increase in local noise levels.	Sensitive noise receptors at 65 dBA: 1 at 20 MNT; 2 at 50 MNT; and 2 at 100 MNT. 70 dBA would have 1 at 100 MNT.	Impacts would be similar to those presented for Spring Creek.	Sensitive noise receptors at 65 dBA: 1 at 20 MNT; 1 at 50 MNT; and 3 at 100 MNT. 70 dBA would have 1 at 100 MNT.
Vibration		Temporary increase in local vibration levels.	Potential structural damage to one residence between 0-100 feet.	No impacts expected.	No impacts expected.
BIOLOGICAL RESOURCES					
Vegetation		Approximately 383-402 acres of grasslands, 29 acres of cropland, and 9.7 acres of forested wetland vegetation lost. Potential damage to vegetation in adjacent areas.	Potential damage to adjacent vegetation in the event of an accidental spill or derailment. Introduction of noxious weeds in disturbed areas.	Approximately 223 acres of grassland, 276 acres of cropland, and 1.0 acres of emergent wetland vegetation lost. Potential damage to vegetation in adjacent areas.	Impacts would be similar to those presented for Spring Creek.

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length		8.5 miles of new construction		10.3 miles of new construction	
Action		Construction	Operation	Construction	Operation
WILDLIFE					
Big Game		Disturbance from noise and human activity along approximately 8.5 miles of yearlong and winter range. Loss of habitat, forage, and cover areas. Mortality and injury due to hunting, poaching, and collision with vehicles.	Fencing may disrupt migration patterns and seasonal use of winter ranges and territories. Reduced water access. Mortality and injury due to collision with trains. Noise disturbance during high-stress periods.	Disturbance from noise and human activity along approximately 10.3 miles of yearlong range and 1.6 miles of winter range for big game habitat. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Upland Birds		2-3 grouse leks within 1.0 mile. Noise disturbance and habitat fragmentation. Loss of habitat. Loss of vegetation. Increased nest predation. Mortality due to collision or crushing by vehicles and machinery.	Noise disturbance and habitat abandonment. Mortality due to train/bird collisions.	3 grouse leks within 1.0 mile. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Waterfowl and Shorebirds		Up to 407.3 acres of potential nesting habitat lost. Disturbance from noise and human activity, especially during nesting. Accidental spills may adversely affect waterfowl. Potential nest loss. Mortality due to collision with vehicles and machinery.	Disturbance from noise and human activity, especially during nesting. Accidental spills may adversely affect waterfowl. Mortality due to train/bird collision.	499.4 acres of potential nesting habitat lost. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length		8.5 miles of new construction		10.3 miles of new construction	
Action		Construction		Construction	
Small Game and Furbearers		Mortality and injury due to hunting, poaching, and vehicle movements. Aquatic species at risk in the event of accidental release of petroleum products.	Mortality or injury due to animal/trains collision. Railroad grade may impede movements of some species. Aquatic species at risk in the event of accidental release of petroleum products.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Non-Game Species					
Amphibians and Reptiles		Loss of habitat, displacement, and mortality.	Mortality due to animal/train collisions. Potential habitat contamination in the event of an accidental spill or derailment.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Songbirds		Loss of 9.7 acres of wooded habitat. Habitat abandonment and fragmentation. Noise disturbance. Nest loss. Mortality due to collision with vehicles and nest disturbance.	Revegetation would provide cover and habitat for some species. Potential loss due to collision with trains. Nest disturbance during tree trimming and right-of-way maintenance.	No wooded habitat lost. Displacement of ground nesting species. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Raptors		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

**Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives**

Table 5.1-2 Summary of Environmental Impacts: Spring Creek Alternatives					
Alternative		Spring Creek		Phiney Flats	
Length	8.5 miles of new construction		10.3 miles of new construction		
Action	Construction		Operation		Operation
Sensitive, Threatened and Endangered Species					
Piping Plover and Interior Least Tern	Disturbance from noise and increased human activity. Loss of food resources from sedimentation. Contamination due to accidental spills. Nest predation. Nest abandonment and failure.	Disturbance from noise and human activity. Nest abandonment. Contamination from accidental spills could cause loss of food resources.	Impacts would be similar to those presented for Spring Creek.		
American Burying Beetle	Approximately 14.5 acres of suitable soil removed or compacted. Habitat disturbed or lost. Artificial lights may attract beetles resulting in disorientation and mortality.	Lights may attract beetles resulting in mortality.	Approximately 174.5 acres of suitable soil removed or compacted. Impacts would be similar to those presented for Spring Creek.		
Bald Eagle	No habitat or nests exists along this alternative. 9.7 acres of wooded potential habitat lost.	No impacts expected.	No nests exist along this alternative. No potential habitat crossed.		
Mountain Plover	Approximately 373-402 acres of potential nesting habitat converted to rail line right-of-way. Noise disturbance. Habitat abandonment. Nest loss. Mortality due to vehicle operation, especially in undeveloped areas.	Noise disturbance and human activity may limit use of available habitat.	Approximately 223 acres of potential nesting habitat converted to rail line right-of-way. Impacts would be similar to those presented for Spring Creek.		
			Impacts would be similar to those presented for Spring Creek.		

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length		8.5 miles of new construction		10.3 miles of new construction	
Action		Construction		Construction	
Swift Fox		Approximately 9-19 acres of prairie dog colonies converted to rail line right-of-way. Noise disturbance and habitat loss. Mortality due to collision with vehicles. Reduced food resources.	Mortality due to collision with trains.	Approximately 14 acres of prairie dog colonies converted to rail line right-of-way. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Sturgeon Chub		Increased sedimentation, and stream modifications could affect downstream habitat. Potential contamination of waterways in the event of an accidental spill.	Potential contamination of waterways in the event of an accidental spill or derailment.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
Black-tailed Prairie Dog		Approximately 9-19 acres of habitat crossed. Loss of habitat. Fragmentation of habitat. Mortality due to recreational shooting and collision with vehicles.	Mortality due to collision with trains. Increased predation and disease due to increased predator presence.	Approximately 14 acres of habitat crossed. Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
TRANSPORTATION					
Transportation		Increased traffic, reduced access, and congestion on local roadways. Accelerated wear and tear on local roadways.	Traffic delays would be minimal due to the limited number of vehicles at grade crossings.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length		10.3 miles of new construction			
Action		Construction		Operation	
SAFETY					
Safety		One Category B grade crossing constructed with crossbucks used for a warning device. Vehicle delays, traffic congestion, and increase risk of accident.	Vehicle delays, increased potential for vehicle/train collisions.	Six Category B grade crossings constructed with crossbucks used for a warning devices. Vehicle delays, traffic congestion, and increased risk of accident.	Impacts would be similar to those presented for Spring Creek.
CULTURAL RESOURCES					
Cultural Resources		Resources within right-of-way could be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	Noise and visual presence of rail line may alter setting and character of traditional cultural properties.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
RECREATION					
Recreation		Approximately 10-102 acres of BGNG lost. Negative impacts due to noise, construction activity, dust, and increased traffic. Enjoyment of recreational experience and overall solitude in wilderness areas would be reduce. Safety in proximity to rail line reduced.	Recreational opportunities would be eliminated along the proposed rail line.	No public land crossed. Potential impacts due to noise and reduced enjoyment of recreational experience in adjacent areas.	Impacts would be similar to those presented for Spring Creek.

Table 5.1-2
Summary of Environmental Impacts:
Spring Creek Alternatives

Alternative		Spring Creek		Phiney Flats	
Length	8.5 miles of new construction		10.3 miles of new construction		
Action	Construction		Operation		Operation
AESTHETICS					
Viewsheds/Scenic Values	Loss of approximately 10- 102 acres of BGNG with VQO of modification. Ground disturbance, clearing of vegetation, and the presence of large machinery would disrupt scenic view.		Visibility may be decreased under certain conditions. Undisturbed vastness disrupted by presence of rail line		No public land crossed. Flat terrain, linear transportation facilities, and agricultural land use would cause rail line to present less of an intrusion to the landscape.
			Impacts would be similar to those presented for Spring Creek.		

Table 5.1-3

**Summary of Environmental Impacts:
Hay Canyon Alternatives**

Alternative		Hay Canyon		Oral		WG Divide	
Length		18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action		Construction	Operation	Construction	Operation	Construction	Operation
GEOLOGY							
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards	Approximately 0.9 miles of Pierre Shale and Fort Union formations crossed. Approximately 43.6 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility would be high in areas containing steep slopes and along the Cheyenne River.	Approximately 4.3 miles of Pierre Shale and Fort Union formations crossed. Approximately 208.5 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Impacts would be similar to those presented for Hay Canyon.	Approximately 1.2 miles of Pierre Shale and Fort Union formations crossed. Approximately 58.2 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Impacts would be similar to those presented for Hay Canyon.	
Soil Resources	Disturbance of 897.0 acres of soil. Loss of topsoil, erosion, and sedimentation. Approximately 373.3 acres of prime farmland lost. Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.	Disturbance of 993.9 acres of soil. Approximately 378.2 acres of prime farmland lost. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Disturbance of 714.4 acres of soil. Approximately 218.2 acres of prime farmland lost. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	

Table 5.1-3

**Summary of Environmental Impacts:
Hay Canyon Alternatives**

Alternative	Hay Canyon		Oral		WG Divide	
	Construction	Operation	Construction	Operation	Construction	Operation
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Minerals and Mining	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
FEDERAL LANDS						
Forest Service Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Bureau of Land Management	No impacts expected.	No impacts expected.	Approximately 6.5 acres of BLM grazing allotment converted to rail line right-of-way. Fragmentation of pastures, isolation of water resources, disruption of operations, and reduced access. Displacement of livestock.	Fencing and fragmentation of allotments, reduced access, and disruption of operations. Mortality or injury due to livestock/train collision.	No impacts expected.	No impacts expected.
Bureau of Reclamation	The Angostura Unit: 2 farm units crossed, 30 acres converted to rail line right-of-way. Potential reduction or loss of irrigation waters to some areas.	Reduced farmability of some lands due to reduction in irrigation water supply.	The Angostura Unit: 13 farm units crossed, 229 acres converted to rail line right-of-way. Potential reduction or loss of irrigation waters to some areas.	Impacts would be similar to those presented for Hay Canyon.	The Angostura Unit: 14 farm units crossed, 233 acres converted to rail line right-of-way. Potential reduction or loss of irrigation waters to some areas.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3
Summary of Environmental Impacts:
Hay Canyon Alternatives

Alternative	Hay Canyon		Oral		WG Divide
	Construction	Operation	Construction	Operation	
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.
Action	Construction	Operation	Construction	Operation	Operation
Fish and Wildlife Service Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Reservation and Treaty Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
WATER RESOURCES					
Surface Water	7 perennial streams and 73 intermittent streams crossed. Stream bank modification and channelization. Erosion, sedimentation, changes in water quality.	Changed hydrology and reduced water quality, changed drainage patterns, and changed water availability.	7 perennial streams and 25 intermittent streams crossed. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	2 perennial streams and 19 intermittent streams crossed. Impacts would be similar to those presented for Hay Canyon.
Wetlands	Approximately 8.9 acres of emergent 5.4 acres of aquatic bed, and 3.6 acres of unconsolidated bottom wetlands converted to rail line right-of-way. Adjacent wetlands may experience sedimentation, changes in hydrology, and may be disturbed during construction activities.	Reestablishment of wetlands in some areas. Permanent loss of adjacent wetlands due to changes in hydrology.	Approximately 2.4 acres of emergent wetlands converted to rail line right-of-way. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Approximately 3.0 acres of emergent and 0.2 acres of shrub/scrub wetlands converted to rail line right-of-way. Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3
Summary of Environmental Impacts:
Hay Canyon Alternatives

Alternative	Hay Canyon		Oral		WG Divide	
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Groundwater	Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
AIR QUALITY						
Air Quality	Temporary increase of fugitive dust, and emissions from construction equipment and delayed vehicles.	Emissions levels for NO _x would exceed thresholds at 50 MNT and 100 MNT.	Impacts would be similar to those presented for Hay Canyon.	Emissions levels for NO _x would exceed thresholds at 20 MNT, 50 MNT and 100 MNT.	Impacts would be similar to those presented for Hay Canyon.	Emissions levels for NO _x would exceed thresholds at 50 MNT and 100 MNT.
NOISE AND VIBRATION						
Noise	Increased noise from construction activities.	Sensitive noise receptors at 65 dBA : 5 at 20 MNT; 7 at 50 MNT; and 7 at 100 MNT. At 70 dBA : 3 at 20 MNT; 6 at 50 MNT; and 6 at 100 MNT	Increased noise from construction activities.	Sensitive noise receptors at 65 dBA : 23 at 20 MNT; 33 at 50 MNT; and 33 at 100 MNT. At 70 dBA : 10 at 20 MNT; 18 at 50 MNT; and 25 at 100 MNT.	Increased noise from construction activities.	Sensitive noise receptors at 65 dBA: 3 at 20 MNT; 4 at 50 MNT; and 4 at 100 MNT. At 70 dBA: 1 at 20 MNT; 3 at 50 MNT; and 3 at 100 MNT.

Table 5.1-3

**Summary of Environmental Impacts:
Hay Canyon Alternatives**

Alternative	Hay Canyon		Oral		WG Divide	
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Vibration	Minor vibrations may be experienced during construction activities.	Potential structural damage to one residence between 0-100 feet; Inconvenience to 4 residences between 101-200 feet; and 2 residences between 201-400 feet.	Impacts would be similar to those presented for Hay Canyon.	No residences are located between 0-100 feet. Inconvenience to 5 residences between 101-200 feet; and 3 residences between 201-400 feet.	Impacts would be similar to those presented for Hay Canyon.	Potential damage to one residence located between 0-100 feet; Inconvenience to one residence between 201-400 feet.
BIOLOGICAL RESOURCES						
Vegetation	Loss of approximately 538.2 acres of grasslands, 87.3 acres of cropland, and 8.9 acres of wetland vegetation. Possible disturbance in adjacent areas.	Noxious weeds may become established in disturbed areas. Use of herbicides could damage adjacent vegetation. Potential loss due to fire.	Loss of approximately 625.5 acres of grasslands, 218.2 acres of cropland, and 2.4 acres of wetland vegetation. Possible disturbance in adjacent areas.	Impacts would be similar to those presented for Hay Canyon.	Loss of approximately 412.1 acres of grasslands, 305.5 acres of cropland, and 3.2 acres of wetland vegetation. Possible disturbance in adjacent areas.	Impacts would be similar to those presented for Hay Canyon.

<p>Table 5.1-3 Summary of Environmental Impacts: Hay Canyon Alternatives</p>						
Alternative	Hay Canyon		Oral		WG Divide	
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles of new construction.	
Action	Construction		Operation		Construction	
Wildlife	Construction		Operation		Construction	
Big Game	Disturbance from noise and human activity along approximately 7.2 miles of yearlong range and 1.5 miles of winter range. Loss of habitat, forage, and cover areas. Mortality and injury due to hunting, poaching pressures, and collision between big game and vehicles.	Fencing may disrupt migration patterns and seasonal use of winter ranges and territories. Reduced access to water sources. Mortality and injury due to collision with trains. Noise disturbance during high-stress periods.	Disturbance from noise and human activity along approximately 14.6 miles of yearlong range and 2.1 miles of winter range. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Disturbance from noise and human activity along approximately 14.0 miles of yearlong range and 2.0 miles of winter range. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Upland Birds	3 grouse leks within 2.0 miles. 625.5 acres of habitat lost. Noise disturbance and habitat fragmentation. Sage grouse habitat could be lost. Loss of vegetation and increased nest predation. Mortality due to collision or crushing by vehicles and machinery.	Noise disturbance and habitat abandonment. Mortality due to train/bird collisions.	3 grouse leks within 2.0 miles. 843.7 acres of habitat lost. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	2 grouse leks within 2.0 miles. 717.6 acres of habitat lost. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3
Summary of Environmental Impacts:
Hay Canyon Alternatives

Alternative	Hay Canyon		Oral		WG Divide	
	Construction	Operation	Construction	Operation	Construction	Operation
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Waterfowl and Shorebirds	Loss of 625.5 acres of grassland and 17.9 acres of wetland habitat. Disturbance from noise and human activity during nesting. Habitat loss, wetland loss, and nest loss. Habitat degradation from accidental spills.	Noise disturbance and habitat abandonment. Mortality due to train/bird collision.	Loss of 843.7 acres of grassland and 2.4 acres of wetland habitat. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Loss of 717.6 acres of grassland and 3.2 acres of wetland habitat. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Small Game and Furbearers	Habitat disruption. Disturbance from noise and human activity. Loss of habitat. Contamination of food resources in the event of an accidental spill. Mortality and injury due to vehicle movements or in the event of an accidental release of petroleum products.	Mortality or injury due to collision between animals and trains. Reduced access to habitat. Mortality in the event of accidental release of petroleum products. Contamination of food resources in the event of an accidental spill.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3

**Summary of Environmental Impacts:
Hay Canyon Alternatives**

Alternative	Hay Canyon		Oral		WG Divide	
	Construction	Operation	Construction	Operation	Construction	Operation
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles of new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Non-Game Species						
Amphibians and Reptiles	Loss of habitat, displacement, and mortality.	Mortality due to collision with trains. Some individuals would return to right-of-way during operation.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Songbirds	Habitat destruction and abandonment. Fragmentation of habitats would occur. Noise disturbance.	Revegetation would provide cover and habitat. Noise disturbance. Mortality due to collision with trains.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Small Mammals	Disturbance from noise and human activity. Loss of habitat. Mortality due to collision with machinery and vehicles.	Noise disturbance. Habitat provided in revegetated areas. Mortality due to animal/train collision.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Raptors	Disturbance from noise and human activity may lead to nest abandonment. Habitat loss.	Disturbance from noise and human activity may cause nest abandonment. Mortality from Raptor/train collisions.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3

**Summary of Environmental Impacts:
Hay Canyon Alternatives**

Alternative	Hay Canyon		Oral		WG Divide
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.
Action	Construction	Operation	Construction	Operation	Construction
Fisheries	7 perennial and 73 intermittent stream crossings. Reduced habitat and food resource availability. Water quality degradation. Increased sediment and erosion. Contamination in the event of an accidental discharge of toxic compounds in close proximity to waterways.	Contamination of waterways could occur in the unlikely event of an accidental spill or derailment in close proximity to streams and waterways.	7 perennial and 25 intermittent stream crossings. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	2 perennial and 19 intermittent stream crossings. Impacts would be similar to those presented for Hay Canyon.
Sensitive, Threatened, and Endangered Species					
American Burying Beetle	Loss of approximately 373.3 acres of potential habitat. Artificial construction lights may attract beetles resulting in disorientation and mortality.	Lights may attract beetles resulting in mortality.	Loss of approximately 378.2 acres of potential habitat. Impacts would be similar to those presented for Hay Canyon.	Potential loss of suitable habitat.	Loss of approximately 218.2 acres of potential habitat. Impacts would be similar to those presented for Hay Canyon.
Ute Ladies'-tresses Orchid	One site crossed. Local populations and potential habitat damaged or destroyed.	Loss of populations due to introduction of noxious weeds.	Potential habitat damaged or destroyed.	Impacts would be similar to those presented for Hay Canyon.	Potential loss of suitable habitat. Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3
Summary of Environmental Impacts:
Hay Canyon Alternatives

Alternative	Hay Canyon		Oral		WG Divide	
	Construction	Operation	Construction	Operation	Construction	Operation
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action						
Bald Eagle	Disturbance from noise and human activity would reduce suitability of approximately 3.6 miles of potential habitat within 1.0 mile of proposed project area.	Decreased potential for use of suitable habitat due to noise disturbance and human activity.	Disturbance from noise and human activity would reduce suitability of approximately 10.8 miles of potential habitat within 1.0 mile of proposed project area.	Impacts would be similar to those presented for Hay Canyon.	Disturbance from noise and human activity would reduce suitability of approximately 5.8 miles of potential habitat within 1.0 mile of proposed project area.	Impacts would be similar to those presented for Hay Canyon.
Mountain Plover	Loss of approximately 538.2 acres of potential nesting habitat. Loss of 9.7 acres of prairie dog colonies. Noise disturbance may cause habitat abandonment. Mortality due to collision with vehicles. Nest lost.	Noise disturbance and human activity may limit use of available habitat.	Loss of approximately 625.5 acres of potential nesting habitat. Impacts would be similar to those presented for Hay Canyon. Information on prairie dog habitat is unavailable.	Impacts would be similar to those presented for Hay Canyon.	Loss of approximately 412.1 acres of potential nesting habitat. Loss of 24.2 acres of prairie dog colonies. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Swift Fox	Loss of approximately 9.7 acres of prairie dog colonies. Noise disturbance and habitat loss. Mortality due to collision with vehicles. Reduced food resources.	Mortality due to collision with trains.	Information on prairie dog colonies is unavailable. Impacts to habitat would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Loss of approximately 24.2 acres of prairie dog colonies. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3

**Summary of Environmental Impacts:
Hay Canyon Alternatives**

Alternative	Hay Canyon		Oral		WG Divide	
	Construction	Operation	Construction	Operation	Construction	Operation
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Sturgeon Chub	Increased sedimentation and stream modifications could affect downstream habitat. Contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spills or derailment.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
Black-tailed Prairie Dog	Loss of approximately 9.7 acres of habitat. Fragmentation of habitat, mortality due to recreational shooting and collision with vehicles, increased predation and disease occurrence.	Mortality from collision with trains. Increased predation and disease due to predator presence.	Information on habitat is not available. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon	Loss of approximately 24.2 acres of habitat. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
TRANSPORTATION						
Transportation	5 new grade crossings. Increased traffic, reduced access, and congestion on local roadways. Accelerated wear and tear on local roadways.	Vehicle delays at grade crossings. Provide shorter routing for PRB coal.	4 new grade crossings. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	15 new grade crossings. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3 Summary of Environmental Impacts: Hay Canyon Alternatives						
Alternative	Hay Canyon		Oral		WG Divide	
Length	18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles or new construction.	
Action	Construction		Operation		Construction	
SAFETY						
Safety	Construction of five Category B grade crossings with crossbucks. Increased potential for accidents.	Traffic delays and the presence of rail traffic would increase the potential for vehicle/train collisions.	Construction of four Category B grade crossings with crossbucks. Increased potential for accidents.	Impacts would be similar to those presented for Hay Canyon.	Construction of fourteen Category B grade crossings. Increased potential for accidents.	Impacts would be similar to those presented for Hay Canyon.
CULTURAL RESOURCES						
Cultural Resources	High potential for discovery along 6.5 miles. Resources within right-of-way could be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	Noise and visual presence of rail line may alter setting and character of traditional cultural properties.	High potential for discovery along 13.3 miles. Replacement of 8 bridges eligible for NRHP listing. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	High potential for discovery along 3.7 miles. Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-3
Summary of Environmental Impacts:
Hay Canyon Alternatives

Alternative		Hay Canyon		Oral		WG Divide	
Length		18.5 miles of new construction.		13.3 miles of new construction and 7.2 miles of reconstruction.		14.7 miles of new construction.	
Action		Construction	Operation	Construction	Operation	Construction	Operation
RECREATION							
Recreation	Disturbance of participants of recreational activities and wildlife due to noise and human presence. Reduced attractiveness of the area due to alteration of visual setting.	Noise disturbance. Reduced usage of areas in proximity to rail line.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.
AESTHETICS							
Viewsheds/Scenic Values	Disruption due to ground disturbance, clearing of vegetation, and the presence of large machinery.	Potential reduction in visibility due to emissions. New rail structures would be highly visible due to numerous high vantage points and lack of weathering and vegetation.	Impacts would be similar to those presented for Hay Canyon, except location at the base of the sideslope would screen rail line from view in some areas.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon, except flatter open terrain would provide less view, and linear corridor would be compatible with visual character of the area.	Impacts would be similar to those presented for Hay Canyon.	Impacts would be similar to those presented for Hay Canyon.

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative	Black Thunder South		Black Thunder North	
	Construction	Operation	Construction	Operation
Length	7.1 miles of new construction.		4.5 miles of new construction.	
Action	Construction	Operation	Construction	Operation
GEOLOGY				
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards	Approximately 3.9 miles of Fort Union Lebo Formations and 3.2 Wasatch Formations crossed. Approximately 344.2 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility high along 7.1 miles, 344.2 acres, containing steep slopes.	Approximately 3.6 miles Fort Union Lebo Formations and 0.9 Wasatch Formations crossed. Approximately 218.2 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility high along 4.5 miles, 218.2 acres, containing steep slopes.
Soil Impacts	Disturbance of 344.2 acres of Group 7 soil. Loss of topsoil, sedimentation, and erosion. Accidental spills could cause contamination of soils. No prime farmland lost.	Contamination in the unlikely event of an accidental spill or derailment.	Disturbance of 218.2 acres of Group 7 soil. Loss of topsoil, sedimentation, and erosion. Accidental spills could cause contamination of soils. No prime farmland lost.	Impacts would be similar to those presented for Black Thunder South.

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative	Black Thunder South		Black Thunder North	
	Length	4.5 miles of new construction.	Construction	Operation
Action				
Paleontological Resources	<p>Approximately 155.1 acres of PFYC rating 5 formations and approximately 189.1 acres of PFYC rating 3 formations converted to rail line right-of-way. Any resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.</p>	<p>No impacts expected.</p>	<p>Approximately 43.6 acres of PFYC rating 5 formations and approximately 174.5 acres of PFYC rating 3 formations converted to rail line right-of-way. Any resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.</p>	<p>No impacts expected.</p>
LAND USE				
Rangeland/ Grazing	<p>Approximately 281.2 acres of rangeland lost. 3 pastures in 2 allotments crossed. Loss of forage, fragmentation of allotments, isolation of water resources, and disruption of operations.</p>	<p>Allotment disturbance resulting in the loss of 45.1 AUMs. Reduced access, loss of forage, and decreased range use.</p>	<p>Approximately 184.2 acres of rangeland lost. 5 pastures in 3 allotments crossed. Loss of forage, fragmentation of allotments, isolation of water resources and disruption of operations.</p>	<p>Allotment disturbance resulting in the loss of 2 AUMs. Reduced access, loss of forage, and decreased range use.</p>
Residential	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Business and Industrial	<p>Approximately 14.5 acres converted to rail line right-of-way. Inconvenience and reduced access.</p>	<p>Improved rail service. Additional noise. Reduced access to patrons and employees crossing rail line.</p>	<p>Approximately 4.8 acres converted to rail line right-of-way. Inconvenience and reduced access.</p>	<p>Improved rail service. Additional noise. Reduced access to patrons and employees crossing rail line.</p>

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative	Black Thunder South		Black Thunder North	
	Length	Action	Operation	Construction
	7.1 miles of new construction.			4.5 miles of new construction.
Minerals and Mining	48.5 acres converted to rail line right-of-way. May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.	29.1 acres converted to rail line right-of-way. May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.
Public Facilities	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
FEDERAL LANDS				
Forest Service Lands	150.3 acres of TBNG converted to rail line right-of-way. Noise, ground disturbance, reduced access.	Increased noise, visual intrusion of rail line, and reduction in use of area in proximity of rail line.	29.1 acres of TBNG converted to rail line right-of-way. Impacts similar to those presented for Black Thunder South.	Impacts similar to those presented for Black Thunder South.
Bureau of Land Management	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Bureau of Reclamation	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Fish and Wildlife Service Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Reservation and Treaty Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

**Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives**

Alternative		Black Thunder South	Black Thunder North
Length		7.1 miles of new construction.	4.5 miles of new construction.
Action		Construction	Construction
		Operation	Operation
STATE LANDS			
State Lands	33.9 acres of State of Wyoming land converted to rail line right-of-way. Ground disturbance, reduced access, noise.	Loss of use, reduced access, increased noise, reduction of use to areas adjacent to rail line.	130.9 acres of State of Wyoming land converted to rail line right-of-way. Impacts similar to those presented for Black Thunder South.
WATER RESOURCES			
Surface Water	12 intermittent streams crossed. Stream bank modifications, channelization, potential stream flow increases, and decreased water quality. Sedimentation, increased erosion, TSS increase, and loss of habitat and food resources. Changes in drainage patterns and water availability.	Potential contamination in the event of an accidental spill or derailment.	9 intermittent streams crossed. Impacts would be similar to those presented for Black Thunder South.
Wetlands	Conversion of approximately 14.5 acres of emergent wet meadow to rail line right-of-way. Sedimentation and changes in hydrology could affect adjacent wetland areas.	Reestablishment of wetlands could occur in some areas along the proposed rail line right-of-way. Changes in hydrology could affect adjacent wetland areas.	Changes in hydrology could affect adjacent wetland areas.
Groundwater	Potential contamination in the unlikely event of an accidental spill.	Potential contamination in the unlikely event of an accidental spill or derailment.	Impacts would be similar to those presented for Black Thunder South.

**Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives**

Alternative		Black Thunder South	Black Thunder North
Length		7.1 miles of new construction.	4.5 miles of new construction.
Action		Construction	Construction
		Operation	Operation
AIR QUALITY			
Air Quality	Temporary reduction in local air quality due to emission from construction equipment and traffic delays.	Impacts due to mine use undetermined due to lack of information available.	Impacts would be similar to those for Black Thunder South.
NOISE AND VIBRATION			
Noise	Temporary increase in local noise levels.	No receptors present. Disturbance to wildlife likely.	Impacts would be similar to those presented for Black Thunder South.
BIOLOGICAL RESOURCES			
Vegetation	Approximately 329.7 acres of grasslands and 14.5 acres of wetland vegetation lost. Potential damage to vegetation in adjacent areas.	Potential damage to adjacent vegetation in the event of an accidental spill or derailment. Introduction of noxious weeds in disturbed areas.	Approximately 218.2 acres of grassland vegetation lost. Potential damage to vegetation in adjacent areas.
			Impacts would be similar to those presented for Black Thunder South.

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative	Black Thunder South		Black Thunder North	
	Construction	Operation	Construction	Operation
Length	7.1 miles of new construction.		4.5 miles of new construction.	
Action	Construction	Operation	Construction	Operation
WILDLIFE				
Big Game	Disturbance from noise and human activity along approximately 3.7 miles of yearlong and 7.1 miles of winter range. Loss of habitat, forage, and cover areas. Mortality and injury due to hunting, poaching, and collision with vehicles.	Fencing may disrupt migration patterns and seasonal use of winter ranges and territories. Reduced water access. Mortality and injury due to collision with trains. Noise disturbance during high-stress periods.	Disturbance from noise and human activity along approximately 2.5 miles of yearlong range and 4.5 miles of winter range for big game habitat. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Upland Birds	5 sage grouse leks within 4.4 miles. Noise disturbance and habitat fragmentation. Sage grouse habitat lost. Loss of vegetation. Increased nest predation. Mortality due to collision or crushing by vehicles and machinery.	Noise disturbance and habitat abandonment. Mortality due to train/bird collisions.	1 sage grouse leks within 4.4 miles. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Waterfowl and Shorebirds	281.2 acres of potential nesting habitat lost. Disturbance from noise and human activity, especially during nesting. Accidental spills may adversely affect waterfowl. Potential nest loss. Mortality due to collision with vehicles and machinery.	Disturbance from noise and human activity, especially during nesting. Accidental spills may adversely affect waterfowl. Mortality due to train/bird collision.	184.2 acres of potential nesting habitat lost. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative	Black Thunder South		Black Thunder North	
	Length	Action	Construction	Operation
	7.1 miles of new construction.		4.5 miles of new construction.	
Small Game and Furbearers	Mortality and injury due to hunting, poaching, and vehicle movements. Aquatic species at risk in the event of accidental release of petroleum products.	Mortality or injury due to animal/trains collision. Railroad grade may impede movements of some species. Aquatic species at risk in the event of accidental release of petroleum products	Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Non-Game Species				
Amphibians and Reptiles	Loss of habitat, displacement, and mortality.	Mortality due to animal/train collisions. Potential habitat contamination in the event of and accidental spill or derailment.	Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Songbirds	Loss of 344.2 acres of grassland habitat. Habitat abandonment and fragmentation. Noise disturbance. Nest loss. Mortality due to collision with vehicles and nest disturbance.	Revegetation would provide cover and habitat for some species. Potential loss due to collision with trains. Nest disturbance during right-of-way maintenance.	Loss of 218.2 acres of grassland habitat. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Raptors	17 nesting sites within 1.0 mile. Noise disturbance, nest abandonment, mortality.	Noise disturbance. Increased mortality due to collision with trains.	19 nesting sites within 1.0 mile. Impacts similar to those presented for Black Thunder South.	Impacts similar to those presented for Black Thunder South.
Aquatic and Fisheries	12 intermittent streams crossed. Potential of increased sediment and reduced water quality downstream from construction sites.	Potential contamination in the event of an accidental spill.	9 intermittent streams crossed. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.

**Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives**

Alternative	Black Thunder South		Black Thunder North	
	Construction	Operation	Construction	Operation
Length	7.1 miles of new construction.		4.5 miles of new construction.	
Action	Construction	Operation	Construction	Operation
Sensitive, Threatened and Endangered Species				
Bald Eagle	No habitat or nests exists along this alternative. Potential disturbance along 0.9 miles of habitat located within 0.5 mile of Little Thunder Creek.	Potential disturbance along habitat located within 0.5 mile of Little Thunder Creek. Suitability of area decreased due to increased human activity and noise disturbance.	Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Mountain Plover	Approximately 344.2 acres of potential nesting habitat converted to rail line right-of-way. Noise disturbance. Habitat abandonment. Nest loss. Mortality due to vehicle operation, especially in undeveloped areas.	Noise disturbance and human activity may limit use of available habitat.	Approximately 218.2 acres of potential nesting habitat converted to rail line right-of-way. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Swift Fox	Potential loss of habitat throughout project area. Noise disturbance and habitat loss. Mortality due to collision with vehicles. Reduced food resources.	Mortality due to collision with trains.	Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
Black-tailed Prairie Dog	Potential loss of habitat. Mortality due to recreational shooting and collision with vehicles.	Mortality due to collision with trains. Increased predation and disease due to increased predator presence.	Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative		Black Thunder South	Black Thunder North
Length		7.1 miles of new construction.	4.5 miles of new construction.
Action		Construction	Operation
TRANSPORTATION			
Transportation	One grade crossing. Increased traffic, reduced access, and congestion on local roadways. Accelerated wear and tear on local roadways.	Vehicle delays would be minimal due to the limited number of vehicles at grade crossing.	No grade crossings. Impacts would be similar to those presented for Black Thunder South..
SAFETY			
Safety	One Category B grade crossing constructed with crossbucks used for a warning device. Vehicle delays, congestion, and increase risk of accident.	Vehicle delays, increased potential for vehicle/train collisions.	No impacts expected.
CULTURAL RESOURCES			
Cultural Resources	Resources within right-of-way could be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	Noise and visual presence of rail line may alter setting and character of traditional cultural properties.	Impacts would be similar to those presented for Black Thunder South.

Table 5.1-4
Summary of Environmental Impacts:
Black Thunder Mine Loop Alternatives

Alternative		Black Thunder South		Black Thunder North	
Length		7.1 miles of new construction.		4.5 miles of new construction.	
Action		Construction		Operation	
RECREATION					
Recreation		Approximately 3.1 miles of TBNG and 0.7 miles of Wyoming state land crossed. Negative impacts due to noise, construction activity, dust, and increased traffic. Enjoyment of recreational experience and overall solitude in wilderness areas reduced. Safety in proximity to rail line reduced.	Recreational opportunities eliminated along the proposed rail line. Reduced access to areas across rail line.	Approximately 0.6 miles of TBNG and 2.7 miles of Wyoming state land crossed. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.
AESTHETICS					
Viewsheds/Scenic Values		Approximately 2.7 miles of TBNG with VQO of modification and 0.4 of VQO of partial retention crossed. Ground disturbance, clearing of vegetation and the presence of large machinery would disrupt scenic view.	Visibility decreased under certain conditions. Undisturbed vastness disrupted by presence of rail line	Approximately 0.6 miles of TBNG with VQO of modification and <0.1 mile of VQO of partial retention crossed. Impacts would be similar to those presented for Black Thunder South.	Impacts would be similar to those presented for Black Thunder South.

Table 5.1-5

**Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives**

Alternative		North Antelope East		North Antelope West	
Length		1.5 miles of new construction.		2.4 miles of new construction.	
Action		Construction	Operation	Construction	Operation
GEOLOGY					
Unique Geological Formations		No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards		Approximately 1.5 miles of Fort Union Lebo Formations crossed. Approximately 72.7 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility high in areas containing steep slopes, however, not common.	Approximately 2.4 miles of Fort Union Lebo Formations crossed. Approximately 116.4 acres of soil with high slump/ landslide potential converted to rail line right-of-way.	Landslide and slump susceptibility would be high in areas containing steep slopes, however, not common.
Soil Impacts		Disturbance of 72.7 acres of Group 4 soil . Loss of topsoil, sedimentation, and erosion. Accidental spills could cause contamination of soils. No prime farmland lost.	Contamination could occur in the unlikely event of an accidental spill or derailment.	Disturbance of 116.4 acres of Group 4 soil. Loss of topsoil, sedimentation, and erosion. Accidental spills could cause contamination of soils. No prime farmland lost.	Impacts would be similar to those presented for North Antelope East.

Table 5.1-5
Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives

Alternative		North Antelope East		North Antelope West	
Length	1.5 miles of new construction.		2.4 miles of new construction.		
Action	Construction	Operation	Construction	Operation	
Paleontological Resources	Approximately 72.7 acres of PFYC rating 3 formations converted to rail line right-of-way. Any resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery and private land ownership.	No impacts expected.	Approximately 116.4 acres of PFYC rating 3 formations converted to rail line right-of-way. Any resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery and private land ownership.	No impacts expected.	
LAND USE					
Rangeland/ Grazing	Approximately 14.5 acres of cropland and pasture lost. Loss of forage, fragmentation of allotments, isolation of water resources and disruption of operations.	4 pastures crossed resulting in the loss of 6.7 AUMs. Reduced access, loss of forage, and decreased range use.	Approximately 92.1 acres of cropland and pasture lost. Loss of forage, fragmentation of allotments, isolation of water resources and disruption of operations.	1 pasture crossed resulting in the loss of 7.8 AUMs. Reduced access, loss of forage, and decreased range use.	
Residential	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	
Business and Industrial	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	
Minerals and Mining	May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.	May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.	
Public Facilities	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	

<p>Table 5.1-5 Summary of Environmental Impacts: North Antelope Mine Loop Alternatives</p>				
Alternative	North Antelope East		North Antelope West	
Length	1.5 miles of new construction.		2.4 miles of new construction.	
Action	Construction	Operation	Construction	Operation
FEDERAL LANDS				
Forest Service Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Bureau of Land Management	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Bureau of Reclamation	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Fish and Wildlife Service Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Reservation and Treaty Lands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
WATER RESOURCES				
Surface Water	2 intermittent streams crossed. Stream bank modifications, channelization, potential stream flow increases, and decreased water quality. Sedimentation, increased erosion, TSS increase, and loss of habitat and food resources. Changes in drainage patterns and water availability.	Potential contamination in the event of an accidental spill or derailment.	4 intermittent streams crossed. Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.

Table 5.1-5
Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives

Alternative		North Antelope East		North Antelope West	
Length		1.5 miles of new construction.		2.4 miles of new construction.	
Action		Construction	Operation	Construction	Operation
Wetlands		Conversion of approximately 0.06 miles of aquatic bed to rail line right-of-way. Sedimentation and changes in hydrology could affect adjacent wetland areas.	Establishment of wetlands in some areas along the proposed rail line right-of-way. Changes in hydrology could affect adjacent wetland areas.	No wetlands crossed. Sedimentation and changes in hydrology could affect adjacent wetland areas.	Impacts would be similar to those presented for North Antelope East.
Groundwater		Potential contamination in the unlikely event of an accidental spill.	Potential contamination in the unlikely event of an accidental spill or derailment.	Impacts would be similar to those presented for Spring Creek.	Impacts would be similar to those presented for Spring Creek.
AIR QUALITY					
Air Quality		Temporary reduction in local air due to emission from construction equipment and vehicle delays.	Impacts due to mine use undetermined due to lack of information available.	Impacts would be similar to those for North Antelope East.	Impacts would be similar to those for North Antelope East.
NOISE AND VIBRATION					
Noise		Temporary increased in local noise levels.	No receptors present. Disturbance to wildlife likely.	Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.

Table 5.1-5

**Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives**

Alternative		North Antelope East		North Antelope West	
Length		1.5 miles of new construction.		2.4 miles of new construction.	
Action		Construction		Construction	
		Operation		Operation	
BIOLOGICAL RESOURCES					
Vegetation		Approximately 14.5 acres of cropland, and 53.3 acres of pasture, and 2.9 acres of wetland vegetation lost. Potential damage to vegetation in adjacent areas.	Potential damage to adjacent vegetation in the event of an accidental spill or derailment. Introduction of noxious weeds in disturbed areas.	Approximately 92.1 acres of cropland and 24.2 acres of pasture vegetation lost. Potential damage to vegetation in adjacent areas.	Impacts would be similar to those presented for North Antelope East.
WILDLIFE					
Big Game		Disturbance from noise and human activity along approximately 1.5 miles of yearlong range. Loss of habitat, forage, and cover areas. Mortality and injury due to hunting, poaching, and collision with vehicles.	Fencing may disrupt migration patterns and seasonal use of winter ranges and territories. Reduced water access. Mortality and injury due to collision with trains. Noise disturbance during high-stress periods.	Disturbance from noise and human activity along approximately 0.3 miles of yearlong range and 2.1 miles of winter range for big game habitat. Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.
Upland Birds		3 sage grouse leks between 4.4 and 6.1 miles. Noise disturbance and habitat fragmentation. Sage grouse habitat lost. Loss of vegetation. Increased nest predation. Mortality due to collision or crushing by vehicles and machinery.	Noise disturbance and habitat abandonment. Mortality due to train/bird collisions.	3 sage grouse leks between 4.4 and 6.1 miles. Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.

Table 5.1-5
Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives

Alternative	North Antelope East		North Antelope West	
	Length	2.4 miles of new construction.	Construction	Operation
Action	Construction	Operation	Construction	Operation
Waterfowl and Shorebirds	67.8 acres of potential nesting habitat lost. Disturbance from noise and human activity, especially during nesting. Accidental spills may adversely affect waterfowl. Potential nest loss. Mortality due to collision with vehicles and machinery.	Disturbance from noise and human activity, especially during nesting. Accidental spills may adversely affect waterfowl. Mortality due to train/bird collision.	116.4 acres of potential nesting habitat lost. Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.
Small Game and Furbearers	Mortality and injury due to hunting, poaching, and vehicle movements. Aquatic species at risk in the event of accidental release of petroleum products.	Mortality or injury due to animal/trains collision. Railroad grade may impede movements of some species. Aquatic species at risk in the event of accidental release of petroleum products	Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.
Non-Game Species				
Amphibians and Reptiles	Loss of habitat, displacement, and mortality.	Mortality due to animal/train collisions. Potential habitat contamination in the event of an accidental spill or derailment.	Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.
Songbirds	Loss of 72.7 acres of cropland and pasture habitat. Habitat abandonment and fragmentation. Noise disturbance. Nest loss. Mortality due to collision with vehicles and nest disturbance.	Revegetation would provide cover and habitat for some species. Potential loss due to collision with trains. Nest disturbance during tree trimming.	Loss of 116.4 acres of cropland and pasture habitat. Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.

Table 5.1-5
Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives

Alternative		North Antelope East		North Antelope West	
Length		1.5 miles of new construction.		2.4 miles of new construction.	
Action		Construction		Operation	
Raptors		3 nesting sites within 1.0 mile. Noise disturbance, nest abandonment, mortality.		3 nesting sites within 1.0 mile. Impacts similar to those presented for North Antelope East.	
Aquatic and Fisheries		2 intermittent streams crossed. Increased sediment and reduced water quality.		4 intermittent streams crossed. Impacts would be similar to those presented for North Antelope East.	
Sensitive, Threatened and Endangered Species					
Bald Eagle		No habitat or nests exists along this alternative. Potential habitat within 1.0 mile of Antelope Creek lost.		Impacts would be similar to those presented for North Antelope East.	
Mountain Plover		Approximately 67.8 acres of potential nesting habitat converted to rail line right-of-way. Noise disturbance. Habitat abandonment. Nest loss. Mortality due to vehicle operation, especially in undeveloped areas.		Approximately 116.4 acres of potential nesting habitat and 0.6 miles of prairie dog colonies converted to rail line right-of-way. Impacts would be similar to those presented for North Antelope East.	

Table 5.1-5
Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives

Alternative		North Antelope East		North Antelope West	
Length		1.5 miles of new construction.		2.4 miles of new construction.	
Action		Construction		Operation	
Swift Fox		Approximately 67.8 acres of potential habitat converted to rail line right-of-way. Noise disturbance and habitat loss. Mortality due to collision with vehicles. Reduced food resources.		Mortality due to collision with trains.	
Black-tailed Prairie Dog		Potential loss of habitat. Mortality due to recreational shooting and collision with vehicles,		Mortality due to collision with trains. Increased predation and disease due to increased predator presence.	
TRANSPORTATION					
Transportation		Increased traffic, reduced access, and congestion on local roadways. Accelerated wear and tear on local roadways.		No impacts expected.	
SAFETY					
Safety		No new crossings. No impacts expected.		No impacts expected.	

Table 5.1-5
Summary of Environmental Impacts:
North Antelope Mine Loop Alternatives

Alternative		North Antelope East		North Antelope West	
Length		1.5 miles of new construction.		2.4 miles of new construction.	
Action		Construction	Operation	Construction	Operation
CULTURAL RESOURCES					
Cultural Resources	Resources within right-of-way could be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery and private land ownership.	Noise and visual presence of rail line may alter setting and character of traditional cultural properties.	Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.	
RECREATION					
Recreation	No public lands crossed. Negative impacts due to noise, construction activity, dust, and increased traffic. Enjoyment of recreational experience and overall solitude in wilderness areas reduced. Safety in proximity to rail line reduced.	Recreational opportunities eliminated along the proposed rail line. Reduced access to areas across rail line.	Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.	
AESTHETICS					
Views/sheds/Scenic Values	No NFS land crossed. Ground disturbance, clearing of vegetation and the presence of large machinery would disrupt scenic view.	Visibility may be decreased under certain conditions. Undisturbed vastness disrupted by presence of rail line	Impacts would be similar to those presented for North Antelope East.	Impacts would be similar to those presented for North Antelope East.	

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
GEOLOGY		
Unique Geological Formations	No impacts expected.	No impacts expected.
Geological Hazards	No impacts expected.	No impacts expected.
Soil Impacts	Approximately 5,309.1 acres of soil would be disturbed. Temporary soil disturbance and erosion. Soils compacted during construction.	Potential contamination in the event of an accidental spill or derailment. Risk of derailment decreased by improved rail conditions.
Paleontological Resources	Paleontological resources likely in lake and river sediments. However, no impacts expected.	No impacts expected.
LAND USE		
Agriculture	Adjacent to approximately 50.9 miles of pasture or grassland, 156.3 miles of cropland, and 79.6 miles of wooded lots and fence rows. Crop and fence damage, soil compaction, and erosion may occur in areas within and adjacent to the right-of-way. Approximately 238.0 miles of prime farmland adjacent to the existing rail line.	Crop damage and soil contamination in the event of an accidental spill or derailment.
Residential	Adjacent to 10.8 miles of residential land. Increased noise and dust, and reduced safety.	Increased noise, safety, dust, and traffic congestion. Lower real estate values.
Business and Industrial	Adjacent to 39.6 miles of business and industrial land. Inconvenience to employees and customers, reduced access, increased noise and dust, reduced safety for workers and patrons, and traffic congestion.	Long term impacts would include increased noise, traffic delays, and reduced access to businesses. improved rail service and increased industrial growth in area.
Minerals and Mining	Increased demand for materials used in rail line construction.	Operation and maintenance could provide continued market for minerals and mined materials.
Public Facilities	Increased noise, dust, and reduced access. Vehicle delays and reduced use by local patrons. Use of facilities by construction workers.	Increased noise and traffic delays, reduced access, and reduced safety.

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
FEDERAL LANDS		
Forest Service Lands	No impacts expected.	No impacts expected.
Bureau of Land Management	No impacts expected.	No impacts expected.
Bureau of Reclamation	No impacts expected.	No impacts expected.
Fish and Wildlife Service Lands	Potential erosion and sedimentation into habitat easement north of Eagle Lake.	Potential for contamination from accidental spills and herbicides.
Reservation and Treaty Lands	No impacts expected.	No impacts expected.
STATE LANDS		
State Wildlife Area and Wildlife Refuges	Increased noise and human activity at nine Wildlife Management Areas.	Noise and human activity could cause disturbance to wildlife.
State Parks	Approximately 2.7 miles of existing rail line adjacent to the Minneopa State Park. Increased noise and traffic congestion. Reduced access and safety.	Increased noise, safety concerns, air emissions, and reduced access.
State Scientific and Natural Areas	Minimal noise disturbance increases.	Minimal noise disturbance increases.
State Forest	14.0 miles of Richard Dorer Memorial Forest crossed. Noise disturbance, possible clearing or trimming of vegetation adjacent to right-of-way.	Noise disturbance. Trimming or clearing of vegetation adjacent to right-of-way.
Utility Corridors	Potential damage to utilities could result in loss of product or service.	No impacts expected.

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
WATER RESOURCES		
Surface Water	19 perennial streams (including 5 trout streams), 14 rivers, 3 lakes and 15 irrigation ditches crossed. Increase TSS and sedimentation. Accidental spill could cause contamination and decreased water quality. Potential channelization or relocation of drainages.	Potential for contamination from accidental spills and herbicides.
Wetlands	Loss of 187.8 acres of wetlands within DM&E right-of-way: 150.2 emergent 7.2 scrub/shrub 19.4 forested 11.0 other. Increased sediment and changes in drainage could affect wetlands outside the DM&E right-of-way.	Contamination of adjacent wetlands in the unlikely event of an accidental spill.
Groundwater	Potential contamination in the unlikely event of an accidental spill.	Potential contamination in the unlikely event of an accidental spill or derailment.
AIR QUALITY		
Air Quality	Temporary increase of fugitive dust and emissions from construction equipment and delayed vehicles.	Emissions levels for NO _x would be exceeded in 8 counties at 20 MNT; NO _x in all counties at 50 MNT; NO _x in all counties, CO in 5 counties, and SO ₂ in one county at 100 MNT.

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
NOISE AND VIBRATION		
Noise	Increased noise during construction activities.	<p>Total noise sensitive receptor increase at 65 dBA:</p> <p>11 trains Wayside only - 53 Wayside/Horn - 268 Horn only - 637</p> <p>21 trains Wayside only - 121 Wayside/Horn - 767 Horn only - 2,651</p> <p>37 trains Wayside only - 225 Wayside/Horn - 1,795 Horn only - 4,490</p> <p>70 dBA:</p> <p>11 trains Wayside only - 8 Wayside/Horn - 12 Horn only - 317</p> <p>21 trains Wayside only - 16 Wayside/Horn - 140 Horn only - 1,724</p> <p>37 trains Wayside only - 34 Wayside/Horn - 446 Horn only - 3,545</p>
Vibration	Minor vibrations may be experienced during construction activities.	<p>Potential damage to 244 structures within 100 feet.</p> <p>Inconvenience to 906 structures within 200 feet, and 2,209 within 400 feet.</p> <p>No hospitals within 400 feet of existing rail line.</p>
BIOLOGICAL RESOURCES		
Vegetation	Approximately 528.5 acres of native prairie lost. Adjacent to approximately 50.9 miles of pasture or grassland, 156.3 miles of cropland, and 79.6 miles of wooded lots and fence rows. Loss of approximately 187.8 acres of wetland vegetation within existing right-of-way: 150.2 acres of emergent, 7.2 acres of scrub/shrub, 19.4 acres of forested, and 11.0 acres of other wetland types.	Adjacent vegetation could be disturbed during maintenance activities. Accidental spills and use of herbicides could damage adjacent vegetation. Noxious weeds may become established in disturbed areas.

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
Wildlife		
Big Game	Disturbance from noise and human activity. Displacement of local populations during construction activities. Mortality and injury may increase due to hunting, poaching and collisions with vehicles.	Noise disturbance and increased deer/train collisions.
Upland Birds	Noise disturbance. Displacement. Increased pressure from hunting and poaching. Nest loss and adult mortality due to construction activities.	Disturbance from noise. Nesting failure. Mortality due to disturbance and collision with passing trains.
Waterfowl	Habitat loss, nest loss, and disturbance from noise and human activity. Nesting failure. Habitat degradation from accidental spills.	Noise disturbance. Abandonment of nesting habitat in proximity to rail line. Mortality from collisions with trains. Contamination of habitat in the event of an accidental spill or derailment.
Small Game and Furbearers	Displacement, disturbance from noise and human activity, and loss of habitat. Mortality and injury due to construction activities.	Mortality from collisions with trains.
Non-game Species		
Amphibians and Reptiles	Loss of habitat, displacement from right-of-way, and mortality.	Mortality from passing trains. Some would return to right-of-way after completion.
Songbirds	Displacement, loss of habitat. Disturbance from noise and human activity. Loss of nests.	Noise disturbance. Mortality due to collisions with trains. Revegetation would provide habitats for some species.
Shorebirds	Loss of habitat. Disturbance from noise and human activity. Nest failure, nest loss, and adult mortality due to construction activities.	Noise disturbance. Mortality from collisions with trains.
Raptors	Disturbance from noise and human activity during nesting. Temporary reduction of prey species.	Increased mortality from collisions with trains. Nesting near tracks is not expected.

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
AQUATIC AND FISHERIES		
Fish and Mussels	Changes in water quality due to sediment. Potential contamination from accidental spills.	Herbicide use and accidental spills may affect aquatic organisms and reduce food resources.
Sensitive, Threatened and Endangered Species		
Topeka Shiner	Two potential Topeka Shiner streams crossed. Increased sediment and accidental spills may adversely affect fish populations.	Accidental releases of fuel or chemicals due to spills or derailment.
Higgin's Eye Pearly Mussel	Increased sediment and accidental spills of petroleum products would adversely affect species.	Accidental spills of petroleum products would adversely affect species.
Prairie Bush-Clover	Destruction of local populations within the right-of-way.	Competition with introduced species during revegetation.
Western Prairie Fringed Orchid	Surface disturbance and destruction of local populations within the right-of-way.	Competition with introduced species during revegetation.
Bald Eagle	Disturbance from noise and human activity. Habitat abandonment. Potential nest failure.	Noise disturbance, failure of nests, and abandonment of use areas. Mortality from eagle/train collisions.
TRANSPORTATION		
Transportation	Accelerated wear and tear on local roadways. Grade crossing closures, detours. Inconvenience, vehicle delays, and reduced access. Minor delays to rail traffic.	Six grade crossings with ADT over 5,000 would experience a decrease in delay per stopped vehicle. Blocked crossing time would range from 2.1 minutes for 115-car train to 2.4 minutes for 135-car trains. A reduction in vehicle delay to an estimated 0.3-0.5 minutes per vehicle. Total blocked crossing time per day would average 23.1 minutes at 20 MNT; 44.1 at 50 MNT; and 77.7 at 100 MNT. No crossings would experience a level of service below B for 6,400 foot trains or C for 7,400 trains.

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
SAFETY		
Safety	Increase risk of accidents and injury. Traffic congestion, vehicle delays, and reduced safety at crossings. Construction equipment could pose a risk to children attracted to the area.	All crossings would experience an increase in accident frequency. Significant increases would occur at 3 crossings at 20 MNT, 6 crossings at 50 MNT, and 18 crossings at 100 MNT.
HAZARDOUS MATERIALS		
Transportation of Hazardous Materials	No impacts expected	Increased rail safety would reduce the likelihood of an accident.
Hazardous Waste Sites	Disturbance of sites may cause exposure to contamination.	Spills could occur in the event of an derailment or as a result of improper handling and storage of hazardous materials.
ENERGY RESOURCES		
Transportation of Energy Resources	No impacts expected	Transportation of PRB Coal would be more economical, reliable, and efficient.
Utilization of Energy Resources	Fuel consumption could be increased due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.	Fuel savings and improved utilization of coal resources.
Recyclable Commodities	Reconstruction would generate large volumes of recyclable materials. Use of used rail, ties, and ballast materials during construction.	More efficient transport provided for commodities currently transported.
CULTURAL RESOURCES		
Cultural Resources	14 archeological sites in or adjacent to existing rail line. Destruction and replacement of 142 bridges and 169 culverts along the existing rail line that are recommended eligible for the National Register. Five historic buildings, two of which are listed in the National Register, located along rail line. Construction activities could expose and damage unknown cultural resources.	No impacts expected

Table 5.1-6
Summary of Environmental Impacts:
Minnesota Rebuild of the Existing DM&E Rail Line

Length	219.0 miles of reconstruction	
Action	Construction	Operation
SOCIOECONOMICS		
Population and Demographics	Short term increases in population.	Increased local population due to increase in permanent employment in railroad industry.
Employment and Income	500 construction jobs. Approximately 300 indirect jobs. Estimated construction earnings of \$84.3 million.	Increase in permanent employment of approximately 350 jobs in the railroad industry with potentially higher wages and better benefits. Decrease in local unemployment.
Public services and fiscal condition	Increase in sales and use taxes of approximately \$18.4 million. Increase in income tax revenue due to increased employment.	Tax revenues of an estimated \$10.5 million paid by railroad. Public services could be improved.
RECREATION		
Recreation	Negative impacts due to noise, construction activity, dust, and increased traffic. Enjoyment of the recreational experience and overall solitude could be reduced. Safety in proximity to the rail line reduced. Increased use by construction workers.	Activities such as hunting, fishing, camping, and biking could experience disturbance in close proximity to rail line. Reduced revenue to local communities could result from decreased recreational use.
AESTHETICS		
Wild and Scenic Rivers	No impact expected	No impact expected
Viewshed/Scenic Values	Ground disturbance and the presence of construction machinery would disrupt scenic views.	New rail structures would be more noticeable due to lack of weathering and clearing of vegetation.
NIGHTLIGHTS		
Nightlights	Residents living near the rail line could experience temporary disturbance from nightlights.	Minor impacts from facility lighting and locomotive headlights to residents living near the rail line.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
GEOLOGY		
Unique Geological Formations	No impacts expected.	No impacts expected.
Geological Hazards	No impacts expected.	No impacts expected.
Soil Impacts	Approximately 7,684.8 acres of soil would be disturbed. Compaction of soils, increased erosion. Approximately 207.1 miles of prime farmland adjacent to the rail line.	Potential contamination in the event of an accidental spill or derailment. Risk of derailment decreased by improved rail conditions.
Paleontological Resources	No impacts expected.	No impacts expected.
LAND USE		
Agriculture	Approximately 469.7 miles adjacent to the rail line. Loss of approximately 176.7 miles of pasture or grassland, and 293.0 miles of cropland. Soil and crop disturbance where crops have encroached on existing right-of-way. Fence damage.	Minimal impact to crops due to prohibited use and fencing of right-of-way. Soil contamination or crop damage could occur in the event of an accidental spill or derailment.
Residential	Adjacent to approximately 1.0 miles of residential land. Ground disturbance, increased noise, dust, and reduced safety.	Increased noise, dust, and traffic congestion. Reduced safety. Lower real estate values.
Business and Industrial	Adjacent to approximately 33.1 miles of business and industrial land. Inconvenience to patrons and employees, reduced access, increased noise, dust, and vehicle delays.	Increased noise, vehicle delays, reduced access, and potential reduction in patronage. Improved rail service and potential for industrial growth.
Minerals and Mining	Increased demand for materials used in rail line construction.	Operation and maintenance could provide continued market for minerals and mined materials.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
Public Facilities	Increased noise, dust, and reduced access. Vehicle delays and reduced use by local patrons. Use of facilities by construction workers.	Reduced access, increased noise, traffic congestion, and reduced safety.
FEDERAL LANDS		
Forest Service Lands	No impacts expected.	No impacts expected.
Bureau of Land Management	No impacts expected.	No impacts expected.
Bureau of Reclamation	Potential ground and vegetation disturbance within a 200-foot section of BOR land, located north of Canning.	No impacts expected.
Fish and Wildlife Service Lands	Disturbance from increased noise and human presence. Mortality of wildlife. Sedimentation of wetlands. 12 Federal Waterfowl Production Areas adjacent to the rail line.	Disturbance due to increased noise and human activity. Mortality of wildlife.
Reservation and Treaty Lands	No impacts expected.	No impacts expected.
STATE LANDS		
State Parks	Increased noise and dust. Vehicle delays, reduced safety in proximity to rail line.	Increased noise, dust, potential wildfire hazard, and potential haze from emissions.
State Game Production Areas	Noise, wildlife disturbance, and decreased public use. Sedimentation could cause loss or damage of adjacent wetlands.	Disturbance of wildlife and natural setting. Decreased use in proximity to rail line.
State Forest	No impacts expected.	No impacts expected.
Utility Corridors	Potential damage to utilities could result in loss of product or service.	No impacts expected.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
WATER RESOURCES		
Surface Water	7 rivers, 230 intermittent streams, and 16 perennial streams crossed. Increased TSS and sedimentation. Accidental spills could cause contamination and decreased water quality. Potential channelization or relocation of drainages.	Potential for contamination from accidental spills and herbicide use.
Wetlands	Loss of approximately 132.9 acres of wetlands: approximately 80.7 acres of emergent; 2.3 acres of scrub/shrub; 40.8 acres of forested; and 9.1 acres of other wetland types. Damage to vegetation, mixing and compaction of wetland soils, alteration of site hydrology, increased sedimentation, and installation of drainage structures could result in loss or damage of adjacent wetlands.	Potential contamination in the event an accidental spill or derailment may cause damage or loss of adjacent wetlands.
Groundwater	Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.
AIR QUALITY		
Air Quality	Temporary increase in emissions from construction equipment and fugitive dust.	Criteria threshold exceeded at 20 MNT for NO _x in 7 counties; at 50 MNT for NO _x in all the counties; and at 100 MNT for NO _x in all counties, CO in 7 counties, and SO ₂ in two counties. Reduced vehicle emissions due to a reduction of queue time and number of vehicles queued at grade-crossings.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
NOISE AND VIBRATION		
Noise	Increased noise levels would occur during construction activities.	<p>Total noise sensitive receptors increase at 65 dBA:</p> <p>11 trains Wayside - 26 Wayside/Horn - 230 Horn - 1,274</p> <p>21 trains Wayside - 41 Wayside/Horn - 613 Horn - 3,954</p> <p>37 trains Wayside - 89 Wayside/Horn - 1,188 Horn - 5,863</p> <p>70 dBA:</p> <p>11 trains Wayside - 0 Wayside/Horn - 34 Horn - 707</p> <p>21 trains Wayside - 6 Wayside/Horn - 189 Horn - 2,051</p> <p>37 trains Wayside - 20 Wayside/Horn - 332 Horn - 4,256</p>
Vibration	Minor vibrations may be experienced during construction activities.	<p>Potential damage to 15 structures within 100 feet of the rail line.</p> <p>Inconvenience to 135 structures between 101-200 feet and 529 between 201-400 feet. No hospitals within 400 feet of existing rail line.</p>
BIOLOGICAL RESOURCES		
Vegetation	Loss of approximately 132.9 acres of wetlands. Approximately 46.3 miles of wooded fence rows and woodlots, 168.5 miles of pasture and grassland, and 303.4 miles of cropland adjacent to the existing rail line may be disturbed.	<p>The establishment of noxious weeds could occur due to the loss of cover vegetation and soil disturbance.</p> <p>Potential damage of adjacent vegetation in the event of an accidental spill, derailment, or misuse of herbicides and vegetation control measures.</p>

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
Wildlife		
Big Game	Disturbance from noise and human activity. Temporary displacement, increased hunting and poaching pressure, and mortality related to increased traffic in the area.	Increased noise disturbance. Mortality and injury due to train/big game collisions.
Upland Birds	Displacement, noise disturbance, loss of habitat along 317.0 miles of rail right-of-way. Loss of nests and nesting females. Hunting and poaching pressures, and mortality related to increased traffic in the area.	Disturbance from noise. Nest failure. Mortality due to collision with trains and excessive disturbance.
Waterfowl and Shorebirds	Displacement, disturbance due to noise and increased human activity, and loss of 132.9 acres of wetland habitat. Loss of nests and nesting hens. Potential habitat degradation in the event of an accidental spill.	Disturbance due to passing trains could lead to abandonment of habitat by hens, reducing potential risk to chicks. Individuals may be struck by passing trains. Contamination of habitat in the event of an accidental spill or derailment.
Small Game and Furbearers	Displacement, disturbance from noise and human activity. Mortality due to hunting, poaching, or construction activity.	Mortality from collisions with trains.
Non-Game Species		
Amphibians and Reptiles	Displacement from right-of-way, loss of 132.9 acres of wetland habitat, and increased mortality.	Accidental spills or derailments could cause contamination of wetland and riverine areas.
Songbirds	Temporary displacement, loss of habitat within 317.0 miles of rail right-of-way, and loss of nests. Noise disturbance.	Noise disturbance. Mortality due to collision with trains. Revegetation would provide habitat for some species.
Small Mammals	Noise disturbance and displacement. Increased mortality due to increased road traffic.	Mortality due to collision with trains.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
Raptors	Displacement and habitat loss. Disturbance due to noise and human activity. Temporary reduction of prey species.	Nesting areas near or in the right-of-way may be abandoned. Mortality may occur due to collision with trains.
Aquatics and Fisheries		
Fish and Mussels	Loss of habitat, increased TSS, and reduced water quality. Mortality due to construction activities along waterways. Potential contamination in the event on an accidental spill.	Accidental spills or derailment could cause contamination of waters.
Sensitive, Threatened and Endangered Species		
Topeka Shiner	Accidental contamination and increased sedimentation could affect populations downstream along the 41 streams which potentially contain Topeka Shiners.	Contamination could occur in the unlikely event of a derailment or accidental spill.
American Burying Beetle	Habitat may be disturbed or lost. Artificial construction lights may attract beetles resulting in disorientation and mortality.	Lights may attract beetles resulting in disorientation and mortality.
Bald Eagle	Human activity, operation of machinery, and noise disturbance may cause habitat abandonment. Removal of trees could cause loss of roosting areas.	Disturbance from noise and human activity. Mortality due to raptor/train collisions.
Piping Plover	Noise disturbance. Nest loss. Increased sedimentation and accidental spills may reduce food resources. Human activity could cause nest abandonment.	Noise disturbance and human activity may limit use of available habitat. Accidental spills could reduce food resources.
Interior Least Tern	Noise disturbance. Nest loss. Increased sedimentation and accidental spills may reduce food resources. Human activity could cause nest abandonment.	Accidental spills could reduce food resources.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
Pallid Sturgeon	Accidental spills could affect water quality reduce food resources. Increased sedimentation could degrade habitat during construction activities involving the Missouri River bridge.	Accidental spills or derailment could cause contamination of waterways.
TRANSPORTATION		
Transportation	Accelerated wear and tear on local roadways. Road closures and detours. Inconvenience, vehicle delays, and reduced access. Emergency vehicles may need to modify current routes. Minor delays to rail traffic.	No grade crossings would experience a level of service below B. Crossings were estimated to be blocked 2.1 minutes for 115-car trains and 2.4 minutes for 135-car trains. Reduction in vehicle delays to 0.3-0.5 minutes per vehicle. Total blocked crossing time per day would average 23.1 minutes at 20 MNT; 44.1 at 50 MNT; and 77.7 at 100 MNT.
SAFETY		
Safety	Increased risk of accident or injury. Traffic congestion, vehicle delays, and reduced safety at crossings. Construction equipment could pose a risk to children attracted to the area.	A significant increase in accident frequency was estimated at 8 crossings at 20 MNT levels, 10 crossings at 50 MNT levels, and 12 crossings at 100 MNT levels.
HAZARDOUS MATERIALS		
Transportation of Hazardous Materials	No impacts expected.	Increased rail safety would reduce the likelihood of an accident.
Hazardous Waste Sites	Disturbance of sites may cause exposure to contamination.	Spills could occur in the event of a derailment or as a result of improper handling and storage of hazardous materials.
ENERGY RESOURCES		
Transportation of Energy Resources	No impacts expected.	Transportation of PRB coal would be more economical, reliable, and efficient.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
Utilization of Energy Resources	Fuel consumption could be affected due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.	Fuel savings and improved utilization of coal resources..
Recyclable Commodities	Reconstruction would generate large quantities of recyclable materials. Use of used rail, ties, and ballast materials could occur during construction.	More efficient transport for commodities currently transported.
CULTURAL RESOURCES		
Cultural Resources	11 archaeological sites in or adjacent to existing rail line right-of-way. Destruction and replacement of 239 bridges and culverts. One bridge and two buildings listed with the national register and 191 bridges recommended eligible are to be replaced. Construction activities could expose and damage unknown cultural resources.	No impacts expected.
SOCIOECONOMICS		
Population and Demographics	Short-term increase.	Small number of relocations due to employment opportunities.
Employment and Income	Approximately 1,246 construction jobs. Approximately 591 indirect jobs. Estimated construction earnings of approximately \$91.4 million.	Over 300 high-paying railroad jobs. Local unemployment decrease.
Public Service and Fiscal Condition	Increased income tax revenue. Sales and use taxes increase of approximately \$11.2 million.	Property taxes could total an estimated \$10.3 million. Public services could be improved.

Table 5.1-7
Summary of Environmental Impacts:
South Dakota Rebuild of the Existing DM&E Rail Line

Length	317.0 miles of reconstruction.	
Action	Construction	Operation
RECREATION		
Recreation	Negative impacts due to noise, construction activity, dust, and increased traffic. Enjoyment of the recreational experience and overall solitude could be reduced. Safety in proximity to the rail line would be reduced. Increased use by construction workers.	Increased noise, crowding in areas more distant from rail line, and vehicle delays. Reduced revenue at parks and local communities could result from decreased recreational use.
AESTHETICS		
Wild and Scenic Rivers	No impacts expected.	No impacts expected.
Viewsheds/Scenic Values	Ground disturbance, vegetation clearing, and the presence of heavy equipment would reduce visual character for an extended distance due to the flat topography. Impacts to visibility would be observed at grade crossings and in proximity to local roadways.	Newly reconstructed rail line and structures would be more visible due to lack of weathering and vegetation growth
Nightlights	Residents living near the rail line could experience temporary disturbance from night lights.	Minor disturbance from locomotive headlights to residents living near the rail line.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2		M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.		10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction	Operation	Construction
GEOLOGY				
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Soil Impacts	No impacts expected.	Approximately 322.4 acres of soil disturbed. Erosion, compaction, and soil mixing. Loss of approximately 96.0 acres of prime farmland	Potential contamination in the event of an accidental spill or derailment. Disturbance during maintenance.	Approximately 44.9 acres of soil disturbed. Erosion, compaction, and soil mixing. No loss of prime farmland. Impacts would be similar to those presented for Alternative M-2.
Paleontological Resources	No impacts expected.	Cut activities near Blue Earth River could encounter such resources. However, unlikely.	No impacts expected.	No impacts expected.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives						
Alternative	M-1	M-2		M-3		
Length	15.6 miles of existing rail line.	13.3 miles of new construction.		10.1 miles of reconstruction and 5.5 miles of new construction		
Action	Operation	Construction	Operation	Construction	Operation	
LAND USE						
Agriculture	Adjacent to approximately 22.0 miles of agriculture land. No impacts expected.	Loss of approximately 196.4 acres of agricultural land. Loss of crops in proposed right-of-way and potential damage to fencing. Inconvenience, reduced access and bisecting of fields. Increased safety concerns on roadways and rail crossings.	Improved access to rail service. Reduced access to fields. Reduced income to farmers. Decreased safety on roadways and crossing rail line. Potential contamination in the unlikely event of a spill or derailment.	Adjacent to approximately 22.0 acres of agriculture land. Loss of crops if encroaching in right-of-way. Potential damage to crops and fencing. Reduced access to fields. Increased safety concerns on roadway and rail crossings.	Improved rail service. Crop damage due to maintenance activities and use of herbicides. Potential contamination in the event of an accidental spill or derailment.	
Residential	Adjacent to approximately 1.8 miles of residential land. No impacts expected.	Loss of approximately 24.2 acres of residential land. Eight houses may require removal. Increased noise, dust, and safety concerns.	Increase noise, traffic delays, safety concerns, and reduction in serenity of rural setting. 47 houses within 500 feet.	Adjacent to approximately 1.8 miles of residential land. Noise, dust, and safety concerns. 236 houses within 500 feet.	Increased noise, dust, safety concerns, and vehicle delays.	

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2	M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction	Operation
Business and Industrial	Adjacent to approximately 6.5 miles of business and industrial land. No impacts expected.	Loss of approximately 1.8 acres of business and industrial land. Removal of two businesses. Safety concerns, dust, noise, and vehicle delays. Inconvenience and reduced access to workers and patrons.	Safety concerns, noise, and vehicle delays. Improved rail service available. Adjacent to approximately 6.5 miles of business and industrial land. Noise, dust, and vehicle delays. Inconvenience and reduced access to workers and patrons. Potential reduction in business.
Minerals and Mining	No impacts expected.	No impacts expected.	Increased noise and vehicle delays. Improved rail service available. Safety concerns at grade crossings.
Public Facilities	No impacts expected.	Reduced access, noise, dust, and vehicle delays. Rerouting required for closed crossings.	Possible use of materials from local sources.
		Vehicle delays at grade crossings. Increased safety concerns.	Increased noise, vehicle delays, reduced access, and safety concerns.
		Emergency vehicles would need to establish new routes. Two new grade separations would provide increased emergency access.	No impacts expected.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2	M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction	Operation
PUBLIC LANDS			
Public Parks	No impacts expected.	Red Jacket Trail and the South Route multi use trail would be crossed. Temporary closures, noise disturbance, dust, delay, inconvenience, and increased safety concern in proximity to rail line.	Increased noise and safety hazards. Increased noise disturbance for park and trail users. Decreased perception of solitude.
		Increased noise and safety concerns in proximity to rail line. Decreased perception of solitude.	Adjacent to Sibley Park, Minnesota River Trail, and Sakatah Singing Hills Trail. Increased noise, dust, and delays in proximity to the rail line.

<p align="center">Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives</p>					
Alternative	M-1	M-2	M-3		
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction		
Action	Operation	Construction	Operation	Construction	Operation
WATER RESOURCES					
Surface Water	No impacts expected.	10 streams crossed, including Blue Earth River. Increased sediment, stream bank modifications, loss of aquatic habitat, degraded water quality. Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.	12 streams, including the Blue Earth River crossed. Temporary increased TSS. Potential stream modifications. Potential alterations of drainage patterns.	Potential contamination in the event of an accidental spill or derailment.
Wetlands	No impacts expected.	Loss of approximately 24.0 acres of emergent wetlands. Change in hydrology.	Alteration of hydrology could cause damage or loss of adjacent wetlands. Degradation in the event of an accidental spill or derailment.	Loss of approximately 22.4 acres of emergent wetlands and 1.1 acres of forested wetlands.	Impacts would be similar to those presented for Alternative M-2.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2		M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.		10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction	Operation	Operation
Groundwater	No impacts expected.	Potential contamination in the unlikely event of an accidental spill.	Potential contamination in the unlikely event of an accidental spill.	Impacts would be similar to those presented for Alternative M-2.
AIR QUALITY				
Air Quality	Emissions would remain at current levels.	Temporary reduction in local air quality due to dust and emissions from construction activities.	Emissions level thresholds would be exceeded for NO _x at 50 and 100 MNT.	Impacts would be similar to those presented for Alternative M-2.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2	M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction Operation	Construction Operation
NOISE AND VIBRATION			
Noise	<p>Total noise receptors impacted at 65 dBA, existing conditions: Wayside only - 5 Wayside/Horn - 46 Horn only - 755 70 dBA: Wayside only - 0 Wayside/Horn- 13 Horn only - 280</p>	<p>Temporary increase in local noise levels from construction activities.</p> <p>Total noise receptors 65 dBA: 11 trains Wayside only - 4 Wayside/Horn-29 Horn only -114 21 trains Wayside only - 6 Wayside/Horn-37 Horn only -232 37 trains Wayside only - 6 Wayside/Horn-44 Horn only -384 70 dBA: 11 trains Wayside only - 0 Wayside/Horn-13 Horn only -42 21 trains Wayside only - 0 Wayside/Horn-22 Horn only -81 37 trains Wayside only - 1 Wayside/Horn-30 Horn only -146</p>	<p>Temporary increase in local noise levels from construction activities.</p> <p>Total noise receptors 65 dBA: 18 trains Wayside only - 7 Wayside/Horn-101 Horn only -1,040 28 trains Wayside only - 7 Wayside/Horn-170 Horn only -1,584 44 trains Wayside only - 7 Wayside/Horn-265 Horn only -2,235 70 dBA: 18 trains Wayside only - 1 Wayside/Horn-34 Horn only - 481 28 trains Wayside only - 5 Wayside/Horn- 46 Horn only - 589 44 trains Wayside only - 7 Wayside/Horn- 98 Horn only - 965</p>

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2	M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction	Operation
Vibration	No impacts expected.	Minor vibration may be experienced during construction.	Potential damage to 7 structures within 100 feet of proposed rail line. Inconvenience to 15 structures between 101-200 feet and 25 between 201-400 feet.
	Minor vibration may be experienced during construction.	Potential damage to 14 structures within 100 feet of rail line. Inconvenience to 63 structures between 101-200 feet and 159 between 201-400 feet.	
BIOLOGICAL RESOURCES			
Vegetation	No impacts expected.	Loss of approximately 196.4 acres of agricultural land, 67.8 acres of woody vegetation, and 24.0 acres of emergent wetlands. Potential damage to vegetation in adjacent areas.	Potential damage to adjacent vegetation from accidental spills or derailment. Noxious weeds may become established in disturbed areas.
		Loss of approximately 22.4 acres of wetlands within the right-of-way. Clearing of vegetation within the right-of-way. Potential damage to vegetation in adjacent areas.	Loss and damage to adjacent vegetation during maintenance of right-of-way.

<p>Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives</p>					
Alternative	M-1	M-2	M-3		
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction		
Action	Operation	Construction	Operation	Construction	Operation
Wildlife					
Wildlife	No impacts expected.	Disturbance from noise and human activity. Habitat loss, displacement, and mortality due to hunting, poaching, and collision with vehicles.	Noise, disturbance, and mortality from wildlife/train collisions.	Impacts would be similar to those presented for Alternative M-2.	Impacts would be similar to those presented for Alternative M-2.
Aquatic Resources and Fisheries	No impacts expected.	Increased TSS in 10 streams, including the Blue Earth River. Alteration and loss of habitat. Changes in hydrology and water quality. Potential contamination in the event of an accidental spill.	Potential exposure of aquatic species to toxic substances in the event of an accidental spill or derailment.	Increased TSS in 12 streams, including the Blue Earth River. Impacts would be similar to those presented for Alternative M-2.	Impacts would be similar to those presented for Alternative M-2.
Sensitive, Threatened and Endangered Species					
Sensitive, Threatened and Endangered Species	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

<p>Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives</p>				
Alternative	M-1	M-2	M-3	
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction	
Action	Operation	Construction	Operation	Operation
TRANSPORTATION				
Transportation	No impacts expected.	Construction of 19 crossings: 3 state highways, 12 county and township roads, 3 city streets, and US 169. Vehicle delays, reduced access, and inconvenience. Redesign of emergency routes. Accelerated wear and tear on local roadways.	Vehicle delays and reduced access. Two crossings with ADTs above 5000. No crossings would experience a level of service below B.	15 county roads and city streets crossed. Impacts would be similar to those presented for Alternative M-2.
				Increased frequency of vehicle delays with shorter delay times. No crossings with ADTs above 5000.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2	M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction	Operation
SAFETY			
Safety	Potential risk of accidents would increase as rail line continues to deteriorate.	Vehicle delays, detours, traffic congestion at grade crossings, and increased construction traffic may increase accidents. Construction of 19 grade crossings on local roadways.	Risks of accidents at new grade crossings. Potential delay of emergency vehicles. Proposed route would have 69 school bus crossings per day.
			Vehicle delays, traffic congestion, and detours. Safety risks at rail crossings and in proximity to construction activity. Increased risk of accident. Increased annual accident frequency.
			Increased frequency of vehicle delays. Existing rail line had 103 school bus crossings per day
HAZARDOUS MATERIALS			
Transportation of Hazardous Materials	Potential risk of accidents would increase as rail line continues to deteriorate.	No impacts expected.	Use of new rail line would decrease the risk of derailment.
			No impacts expected.
			Improvements to existing rail would reduce the likelihood of an accidental spill or hazardous materials.

Table 5.1-8
Summary of Environmental Impacts:
Mankato Alternatives

Alternative	M-1	M-2		M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction	
Action	Operation	Construction	Operation	Operation
Hazardous Waste Sites	No impacts expected.	Disturbance of unknown sites may cause exposure to contamination.	Spills could occur in the event of a derailment or as a result of improper handling and storage of hazardous materials.	Impacts would be similar to those presented for Alternative M-2.
ENERGY RESOURCES				
Transportation of Energy Resources	No impacts expected.	No impacts expected.	Transportation of PRB coal would be more economical, reliable, and efficient.	No impacts expected.
Utilization of Energy Resources	No impacts expected.	Fuel consumption increased due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.	Fuel savings and improved utilization of coal resources.	Impacts would be similar to those presented for Alternative M-2.

Table 5.1-8

**Summary of Environmental Impacts:
Mankato Alternatives**

Alternative	M-1	M-2	M-3
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction
Action	Operation	Construction Operation	Construction Operation
CULTURAL RESOURCES			
Cultural Resources	No impacts expected.	A total of 22 sites within a mile of proposed rail line. Five NHRP sites are located within a mile of proposed rail line. Two unevaluated sites are located within the proposed right-of-way. Resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.
		No impacts expected.	14 sites identified in or adjacent to the existing right-of-way. 11 historic structures, consisting of culverts and bridges within the DM&E rail line right-of-way, could be damaged or lost.
			No impacts expected.

<p>Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives</p>					
Alternative	M-1	M-2	M-3		
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction		
Action	Operation	Construction	Operation	Construction	Operation
SOCIOECONOMICS					
Socioeconomics	No impacts expected.	85 construction jobs created. Increased use of local businesses. Increased tax revenue. Small number of relocations due to employment opportunities.	Increased tax revenues. High paying railroad jobs. Local unemployment decrease. Potential increase in local population. Public services could be improved.	Impacts would be similar to those presented for Alternative M-2.	Impacts would be similar to those presented for Alternative M-2.

<p>Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives</p>					
Alternative	M-1	M-2	M-3		
Length	15.6 miles of existing rail line.	13.3 miles of new construction.	10.1 miles of reconstruction and 5.5 miles of new construction		
Action	Operation	Construction	Operation	Construction	Operation
RECREATION					
Recreation	No impacts expected.	Increased noise disturbance and safety concerns in proximity to the proposed rail line. Delays and detours on several bike trails which cross proposed route. Visual impacts due to the presence of construction machinery and ground disturbance.	Bike trails would cross proposed route six times. Delays at crossings. Increased safety risks to trail users and visitors to Mt. Kato ski area. Potential decrease in overall quality of outdoor experience.	Alternative M-3 would cross bike trails 5 times. Increased noise disturbance at nearby parks. Vehicle delays, reduced access, and safety concerns. Potential decreased use of facilities near rail line. Visual impacts due to the presence of construction machinery and ground disturbance.	Noise disturbance at nearby parks. Vehicle delays and safety concerns in proximity of rail line crossings. Alternative M-3 would cross bike trails 5 times. Potential decrease in overall quality of outdoor experience.
AESTHETICS					
Wild and Scenic Rivers	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

<p>Table 5.1-8 Summary of Environmental Impacts: Mankato Alternatives</p>					
Alternative	M-1	M-2		M-3	
Length	15.6 miles of existing rail line.	13.3 miles of new construction.		10.1 miles of reconstruction and 5.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation
Viewsheds/Scenic Values	No impacts expected.	Ground disturbance and the presence of construction machinery would disrupt scenic view. Breakup of natural setting.	Permanent change of rural landscape with addition of rail line and railroad facilities.	Ground disturbance and the presence of construction machinery would disrupt scenic view.	New rail structures would be more noticeable due to lack of weathering and clearing of vegetation; temporary effects.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2	O-3	O-4	O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.	9.5 miles of reconstruction and 2.9 miles of new construction	9.5 miles of reconstruction and 1.7 miles of new construction.	9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation
GEOLOGY					
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Soil Impacts	No impact expected.	Disturbance along 8.9 miles, of approximately 216.9 acres, of existing right-of-way. Soil disturbance and erosion of adjacent soil. Potential loss of productivity.	Potential contamination from accidental spills of hazardous materials.	Impacts would be the same as those for Alternative O-2 along the existing rail line. New construction would cause disturbance of 2.9 miles, approximately 70.3 acres, of soil. Loss of 70.3 acres of prime farmland. Drainage needed due to high water table. Soil compaction and mixing.	Potential contamination from accidental spills of hazardous materials.	Impacts would be the same as those for Alternative O-2 along the existing rail line. New construction would cause disturbance of 1.7 miles, approximately 41.2 acres, of soil. Loss of 41.2 acres of prime farmland. Drainage needed due to high water table. Soil compaction and mixing.	Potential contamination from accidental spills of hazardous materials.	Impacts would be the same as those presented for Alternative O-2.	Impacts would be the same as those presented for Alternative O-2.
Paleontological Resources	No impact expected.	Impacts considered unlikely.	No impact expected.	Impacts considered unlikely.	No impact expected.	Impacts considered unlikely.	No impact expected.	Impacts considered unlikely.	No impact expected.

<p>Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>									
Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
LAND USE									
Agriculture	No impact expected.	Adjacent to 6.1 miles of agriculture land. Loss of crops that encroach on right-of-way. Reduced access, inconvenience.	Potential damage due to right-of-way maintenance activities. Reduced field access. Increased inconvenience to farmers.	Impacts would be the same as those for Alternative O-2 along the existing rail line. Loss and damage of crops. New construction would cross approximately 2.9 miles of agricultural land. Approximately 70.3 acres of prime farmland would be lost. Reduced access and increased safety concerns.	Impacts would be the same as those for Alternative O-2 along existing rail line. Reduced safety along roadways and unprotected crossings. Reduced access. Reduced farm income.	Impacts would be the same as those for Alternative O-2 along the existing rail line. Loss and damage of crops. New construction would cross approximately 1.7 miles of agricultural land. Approximately 41.2 acres of prime farmland would be lost. Reduced access and increased safety concerns.	Impacts would be the same as those presented for Alternative O-2 3.	Impacts would be the same as those presented for Alternative O-2	Impacts would be the same as those presented for Alternative O-2.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

[illegible]

<p align="center">Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>									
Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Public Facilities	No impacts expected.	Temporary increase in noise, dust, and vehicle delays to a Church - 0.2 miles away, hospital - 0.9 miles away, and school - 0.2 miles away.	Increased noise, dust, and vehicle delays. Potential safety concerns for pedestrians.	Impacts would be the same as those presented for Alternative O-2.	Impacts would be the same as those presented for Alternative O-2.	Impacts would be the same as those presented for Alternative O-2.	Impacts would be the same as those presented for Alternative O-2.	Impacts would be the same as those presented for Alternative O-2.	Impacts would be the same as those presented for Alternative O-2.
PUBLIC LANDS									
Public Parks	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
WATER RESOURCES									
Surface Water	No impacts expected.	Temporary increase in TSS from erosion and instream work in two intermittent and one perennial stream.	Potential contamination from accidental spill or use of herbicides.	Similar to O-2 with the addition of crossings of one intermittent stream and one county drainage ditch.	Impacts would be similar to those presented for Alternative O-2	Similar to O-2 with the addition of crossings of two intermittent streams.	Impacts would be the same as those presented for Alternative O-2	Impacts would be similar to those presented for Alternative O-2	Impacts would be similar to those presented for Alternative O-2

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative		O-1		O-2		O-3		O-4		O-5	
Length		9.5 miles of existing rail		9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action		Operation		Construction		Operation		Construction		Operation	
Wetlands		No impacts expected.		Loss of approximately 3.9 acres of emergent wetlands in right-of-way. Potential damage or loss of adjacent wetlands due to sedimentation.		Adjacent wetlands could be damaged in the event of an accidental spill.		Impacts would be similar to those presented for Alternative O-2 along the existing rail line. Sedimentation and changes in hydrology could affect adjacent wetlands.		Impacts would be similar to those presented for Alternative O-2 along the existing rail line. Loss of wetlands adjacent to connection due to changes in hydrology.	
Groundwater		No impacts expected.		Potential contamination in the event of an accidental spill.		Potential contamination in the event of a chemical spill.		Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.	
								Impacts would be similar to those presented for Alternative O-3.		Impacts would be similar to those presented for Alternative O-2.	
								Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.	

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2		O-3		O-4		O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
AIR QUALITY								
Air Quality	Emission levels would remain the same.	Temporary increase of fugitive dust. Emissions from construction equipment and delayed vehicles.	Threshold emissions level exceeded for NO _x at 50 and 100 MNT.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

<p align="center">Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>									
Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
NOISE AND VIBRATION									
Noise	No impacts expected.	Temporary increase in local noise levels due to construction activities.		Total increase in noise receptors at 65 dBA: 11 trains Wayside 0 Wayside/horn 3 Horn 1 21 trains Wayside 1 Wayside/horn 64 Horn 155 37 trains Wayside 16 Wayside/horn 139 Horn 430 70 dBA: 11 trains Wayside 0 Wayside/horn 3 Horn 3 21 trains Wayside 2 Wayside/horn 25 Horn 87 37 trains Wayside 9 Wayside/horn 64 Horn 263		Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.	
				Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.	
				Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.		Impacts would be similar to those presented for Alternative O-2.	

Table 5.1-9

**Summary of Environmental Impacts:
Owatonna Alternatives**

Alternative	O-1	O-2		O-3		O-4		O-5
		Construction	Operation	Construction	Operation	Construction	Operation	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Vibration	No impacts expected.	Minor vibrations may be experienced during construction activities.	27 structures within 100 feet, 82 between 101-200 feet, and 268 between 201-400. No known structures with sensitive equipment.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2 with one additional structure within 201-400 feet	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.
BIOLOGICAL RESOURCES								
Vegetation	No impacts expected.	Adjacent to approximately 1.0 miles of pasture land, 3.3 miles of woodland, and 6.1 miles of cropland. Loss of or damage to vegetation in right-of-way.	Potential damage to adjacent vegetation during maintenance activities.	Impacts would be similar to those presented for Alternative O-2 with an additional 50.9 acres of cropland being converted to railroad right-of-way.	Impacts would be similar to those presented for Alternative O-2, adjacent to an additional 4.2 miles of cropland. Potential damage during maintenance of right-of-way.	Impacts would be similar to those presented for Alternative O-2 with an additional 36.4 acres of cropland being converted to railroad right-of-way.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

<p>Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>									
Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
WILDLIFE									
Wildlife	No impacts expected.	Temporary disturbance from noise and human activity. Loss of habitat.	High frequency of disturbance from increased train traffic. Mortality from wildlife/train collisions.	Impacts would be similar to those presented for Alternative O-2 with an additional 50.9 acres of cropland habitat lost.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2 with an additional 36.4 acres of cropland habitat lost.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.
Aquatic Resources and Fisheries	No impacts expected.	2 perennial and 2 intermittent streams crossed. Temporary increase in TSS. Alteration or loss of aquatic habitat at crossings and downstream.	Potential contamination due to the accidental release of toxic substances or derailment.	Impacts would be similar to those presented for Alternative O-2 with an additional intermittent stream and a drainage ditch.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2 with 2 additional intermittent streams.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

<p>Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>									
Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Sensitive, Threatened and Endangered Species									
Sensitive, Threatened and Endangered Species	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
TRANSPORTATION									
Transportation	No impacts expected.	Increased traffic, reduced access, and traffic congestion on local roadways. Accelerated wear and tear on local roadways.	Two public crossings with ADTs over 5,000 would experience a reduction in delay per stopped vehicle and maximum queue length with an increased frequency of delays.	Impacts would be similar to those presented for Alternative O-2 with three additional grade crossings.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2 with construction of two additional grade crossings.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2	O-3	O-4	O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.	9.5 miles of reconstruction and 2.9 miles of new construction	9.5 miles of reconstruction and 1.7 miles of new construction.	9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation
SAFETY					
Safety	Potential risk of accidents would increase as rail line continues to deteriorate. Existing rail line is crossed by school buses 294 times.	Vehicle delays, traffic congestion, and increased construction related traffic may increase risk of accidents.	Accident frequency would decrease at 20 MNT and 50 MNT levels; increase at 100 MNT. Increase would be below the level of significance.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.
HAZARDOUS MATERIALS					
Transportation of Hazardous Materials	Potential risk of accidents would increase as rail line continues to deteriorate.	No impacts expected.	Reduced potential for accidents due to improved condition of existing rail line.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2		O-3		O-4		O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Hazardous Waste Sites	No impacts expected.	Disturbance of unknown sites in right-of-way may cause exposure to contamination.	Spills could occur in the event of a derailment or result from improper handling and storage of hazardous materials.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.
ENERGY RESOURCES								
Transportation of Energy Resources	No impacts expected.	No impacts expected.	Transportation of PRB coal would be more economical, reliable, and efficient.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

<p>Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>								
Alternative	O-1	O-2		O-3		O-4		O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Utilization of Energy Resources	No impacts expected.	Fuel consumption increased due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.	Fuel savings and improved utilization of coal resources.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

<p>Table 5.1-9 Summary of Environmental Impacts: Owatonna Alternatives</p>									
Alternative	O-1	O-2		O-3		O-4		O-5	
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction	Operation
CULTURAL RESOURCES									
Cultural Resources	No impacts expected.	11 historic structures within the existing rail line right-of-way could be damaged or lost.	No impacts expected.	Impacts would be similar to those presented for Alternative O-2. Any resources located within the proposed new right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-3.	Impacts would be similar to those presented for Alternative O-3.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2		O-3		O-4		O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
SOCIOECONOMICS								
Socioeconomics	Failure to upgrade the existing rail line could result in DM&E ceasing to be a viable railroad.	49 construction jobs created. Small number of relocations due to employment opportunities. Increased tax revenue. Increased use of local public facilities.	Increased tax revenue. High paying railroad jobs and local unemployment decrease. Potential increase in population. Public services could be improved.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2	O-3	O-4	O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.	9.5 miles of reconstruction and 2.9 miles of new construction	9.5 miles of reconstruction and 1.7 miles of new construction.	9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation
RECREATION					
Recreation	No impacts expected.	Negative impacts due to noise, dust, construction activity, and increased traffic. Reduced safety in proximity of the rail line. Crowding in areas further from construction areas. Reduced use of facilities.	Six parks and Straight River canoeing area located within 0.5 mile of existing rail line. Reduced safety near tracks due to more frequent and higher speed trains. Increased noise. Disturbance of activities such as picnicking, hiking, ball games, swimming, and canoeing. Decreased use of facilities near rail line.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

Table 5.1-9
Summary of Environmental Impacts:
Owatonna Alternatives

Alternative	O-1	O-2		O-3		O-4		O-5
Length	9.5 miles of existing rail	9.5 miles of reconstruction.		9.5 miles of reconstruction and 2.9 miles of new construction		9.5 miles of reconstruction and 1.7 miles of new construction.		9.5 miles of reconstruction with connection in right-of-way.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
AESTHETICS								
Wild and Scenic Rivers	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Viewshed/Scenic Values	No impacts expected.	Temporary visual impacts due to construction activities.	New rail and structures would be more noticeable due to lack of weathering and cleared vegetation; temporary.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.	Impacts would be similar to those presented for Alternative O-2.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	23.3 miles existing rail.		23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
GEOLOGY								
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards	No impacts expected.	No impacts expected.	No impacts expected.	Project crosses approximately 2.1 miles of karst topography. Construction activities could encounter sink holes.	Train weight and vibration could open a sink hole causing damage to rail bed and possible derailment. Accidental spill could contaminate ground water.	Impacts would be the same as those presented for Alternative R-3.	Impacts would be the same as those presented for Alternative R-3.	Impacts would be the same as those presented for Alternative R-3.
Soil Impacts	No impacts expected.	Approximately 564.8 acres of soil disturbed. Erosion and soil compaction. No loss of prime farmland.	Potential contamination due to accidental spills.	Approximately 826.6 acres of soil disturbed. Erosion and soil compaction. Loss of 606.0 acres of prime farmland.	Disturbance from right-of-way clearing activities	Impacts would be the same as those presented for Alternative R-3.	Impacts would be the same as those presented for Alternative R-3.	Impacts would be the same as those presented for Alternative R-3.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
Paleontological Resources	No impacts expected.	Reconstruction near Blue Earth River could encounter resources. However, unlikely.	No impacts expected.	Construction of crossing at Zumbro River and other waterways could encounter resources.	No impacts expected.	No impacts expected.
LAND USE						
Agriculture	Adjacent to approximately 7.9 miles of agriculture land. No impacts expected.	Adjacent to approximately 7.9 miles of agriculture land. Loss of crops encroaching in right-of-way. Potential damage to fencing. Reduced access to fields and increased safety concerns on roadways and rail crossings.	Improved rail service. Crop damage due to maintenance activities and use of herbicides. Potential contamination in the event of an accidental spill or derailment.	Approximately 727.3 acres of agriculture land converted to right-of-way. Damage to crops and fencing. Soil loss, mixing, and compaction. Inconvenience to farmers. Reduced access and bisecting of fields. Loss of 606.0 acres of prime farmland.	Improved access to rail service. Reduced access to fields. Decreased safety on roadways and crossing rail line. Potential contamination in the unlikely event of a spill or derailment. Potential reduced income from loss of field use.	Impacts would be the same as Alternative R-3.
						Impacts would be the same as Alternative R-3.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1	R-2		R-3		R-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Length	23.3 miles existing rail.	23.3 miles of reconstruction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.	
Action							
Public Facilities	Services would remain the same.	Noise, dust, and traffic delays. Rerouting would be required for closed crossings. Impacts may affect Federal Bureau of Prisons facility, within 200 feet of the rail line, and Mayo Clinic, within 1,000 feet of the rail line.	Increased vibrations, noise, and traffic delays during train events.	Reduced access and traffic delays. Rerouting to rural areas. Increased safety concerns.	Traffic delays at grade crossings. Increased safety concerns.	Impacts would be the same as Alternative R-3.	Impacts would be the same as Alternative R-3.

**Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives**

Alternative	R-1		R-2		R-3		R-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	23.3 miles existing rail.		23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
PUBLIC LANDS								
Public Lands	No impacts expected.	Increased dust, noise, and disturbance to approximately 1.9 miles of the Gordon W. Yeager State Wildlife Management area, adjacent to rail line. Increased safety concerns.	Noise, dust, and safety concerns may affect wildlife and patrons of management area in proximity of the rail line.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4
	Operation	Construction	Operation	Construction	Operation	Construction	
Length	23.3 miles existing rail.		23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation
WATER RESOURCES							
Surface Water	No impacts expected.	7 perennial, 8 intermittent streams crossed. Temporary increased TSS. Stream modification during culvert and bridge reconstruction. Loss of aquatic habitat. Potential contamination in the event of a spill.	Potential contamination from accidental spills or derailments.	28 intermittent, and 8 perennial streams crossed. Increased TSS. Stream bank modifications and loss of aquatic habitat. Degraded water quality. Potential contamination in the event of a spill.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be the same as Alternative R-3.	Impacts would be similar to those presented for Alternative R-2.

Table 5.1-10

**Summary of Environmental Impacts:
Rochester Alternatives**

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
Wetlands	No impacts expected.	Loss 1.4 acres of riverine, 1.6 acres of palustrine-scrub/shrub, 22.5 acres of palustrine emergent wetlands.	Alterations to drainage patterns could change hydrology in adjacent wetlands. Degradation in the unlikely event of an accidental spill or derailment.	Loss of 9.5 acres of forested-scrub/shrub wetland, 8.1 acres of scrub-shrub, 2.7 acres of forested, 2.3 acres of emergent scrub/shrub, 30.5 acres of palustrine emergent, and 0.1 acres of riverine wetlands. Probability of calcareous fens.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be the same as for Alternative R-3.
Groundwater	No impacts expected.	Potential contamination in the unlikely event of an accidental spill.	Potential contamination in the unlikely event of an accidental spill or derailment.	Karst topography in project area increases risk of contamination of ground water in the event of an accidental spill.	Karst topography in project area increases risk of contamination of ground water in the event of an accidental spill or derailment.	Impacts would be the same as for Alternative R-3.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
AIR QUALITY						
Air Quality	Emissions would remain at current levels.	Temporary localized decrease in air quality due to emissions and dust from construction equipment.	Emissions level thresholds would be exceeded for NO _x at 20, 50, and 100 MNT.	Temporary localized decrease in air quality due to emissions and dust from construction equipment.	Emissions level thresholds would be exceeded for NO _x at 20 and 50 MNT; for CO and NO _x at 100 MNT.	Impacts similar to those presented for Alternative R-3.
						Impacts similar to those presented for Alternative R-3.

Table 5.1-10

**Summary of Environmental Impacts:
Rochester Alternatives**

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
NOISE AND VIBRATION						
Noise	No impacts expected.	Temporary increase in local noise levels from construction activities.	Total increase in noise receptors at 65 dBA: 11 trains Wayside 0 Wayside/horn 30 Horn 0 21 trains Wayside 17 Wayside/horn 184 Horn 487 37 trains Wayside 48 Wayside/horn 402 Horn 1,524 70 dBA: 11 trains Wayside 1 Wayside/horn 31 Horn 0 21 trains Wayside 8 Wayside/horn 63 Horn 365 37 trains Wayside 8 Wayside/horn 183 Horn 836	Temporary increase in local noise levels from construction activities.	Total increase in noise receptors at 65 dBA: 11 trains Wayside 0 Wayside/horn 1 Horn 22 21 trains Wayside 0 Wayside/horn 2 Horn 38 37 trains Wayside 1 Wayside/horn 7 Horn 69 70 dBA: 11 trains Wayside 0 Wayside/horn 0 Horn 6 21 trains Wayside 0 Wayside/horn 0 Horn 15 37 trains Wayside 0 Wayside/horn 1 Horn 26	Impacts the same as those presented for Alternative R-3.
						Impacts the same as those presented for Alternative R-3.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4	
	Length		Length		Length		Length	
	23.3 miles existing rail.		23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.	
Action	Operation		Operation		Operation		Operation	
	Vibration		Vibration		Vibration		Vibration	
	No impacts expected.		<p>Minor vibration may be experienced during construction activities.</p> <p>Potential damage to 32 structures within 100 feet. Inconvenience to 180 structures between 101-200 feet, and 364 between 201-400 feet. No vibration impact to Federal Medical Center's security fence approximately 200 feet from the rail line.</p> <p>Potential impact to sensitive equipment in Mayo Clinic building, 1,000 feet from rail line, and PEMSTAR manufacturing facility, 150 feet from the rail line.</p>		<p>Minor vibration may be experienced during construction activities.</p> <p>Inconvenience to 1 structure between 101-200 feet, and 4 between 201-400.</p>		<p>Impacts similar to those presented for Alternative R-3.</p> <p>Impacts similar to those presented for Alternative R-3.</p>	

Table 5.1-10

**Summary of Environmental Impacts:
Rochester Alternatives**

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
BIOLOGICAL RESOURCES						
Vegetation	No impact expected.	Adjacent to approximately 4.7 miles of pasture, 20.8 miles of woody vegetation, and 4.9 miles of crop land. Loss of vegetation within right-of-way, including 25.5 acres of wetland vegetation. Potential damage or loss of woody vegetation and crops in adjacent areas.	Disturbance of vegetation during maintenance activities. Potential damage or loss of vegetation in adjacent areas in the event of an accidental spill or derailment. Noxious weeds may become established in disturbed areas.	Loss of vegetation on approximately 727.3 acres of crop land, 53.2 acres of wetlands, and 61.8 acres of wooded fence rows and woodlots. Potential damage or loss of vegetation in adjacent areas.	Potential damage to adjacent vegetation from accidental spills or derailment. Noxious weeds may become established in disturbed areas.	Impacts the same as those presented for Alternative R-3.
						Impacts the same as those presented for Alternative R-3.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
Wildlife						
Wildlife	No impact expected.	Disturbance from noise and human activity. Habitat loss within right-of-way and adjacent areas. Temporary displacement of local populations. Mortality and injury due to hunting, poaching, and collisions with vehicles.	Noise disturbance, Mortality from collisions with trains.	Impacts would be similar to those presented for Alternative R-2. Clearing for right-of-way would increase habitat loss and mortality. Permanent displacement could occur.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be the same as those presented for Alternative R-3.
						Impacts would be similar to those presented for Alternative R-3.

Table 5.1-10

**Summary of Environmental Impacts:
Rochester Alternatives**

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
Aquatic Resources and Fisheries	No impact expected.	Temporary increase in TSS in 7 perennial streams, including the Zumbro River, and 8 intermittent streams crossed. Aquatic habitat at crossings and downstream could be altered or lost. Potential contamination in the event of an accidental spill.	Potential exposure of aquatic species to toxic substances in the event of an accidental spill or derailment.	Temporary increase in TSS in 10 perennial streams, and 28 intermittent streams crossed. Channelization and stream bank modifications. Alteration and loss of aquatic habitat, and change in hydrology. Potential contamination in the event of an accidental spill.	Impact would be similar to those presented for Alternative R-2.	Impacts would be the same as those presented for Alternative R-3.
Sensitive, Threatened, and Endangered Species						
Sensitive, Threatened, and Endangered Species	No impact expected.	No impact expected.	No impact expected.	No impact expected.	No impact expected.	No impact expected.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4	
Length	23.3 miles existing rail.		23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.	
Action	Operation		Construction		Operation		Construction	
TRANSPORTATION								
Transportation	No additional impacts expected.		Increased traffic, reduced access, and congestion on roadways. Accelerated wear and tear on local roadways.		Seven grade crossings with ADTs above 5,000 would experience a reduction in delay per stopped vehicle and queue length with an increase in frequency of delays at all proposed operating levels.		Installation of 34 grade crossings on local roadways. Vehicle delays, detours, and traffic congestion.	
					No crossings with ADTs over 5,000. Five potential crossings used by school buses. Vehicle delays at grade crossings. New routing of emergency vehicles could be required.		Impacts would be the same as those presented for Alternative R-3.	
							Impacts would be the same as those presented for Alternative R-3.	

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
SAFETY								
Safety	Potential risk of rail accidents would increase as rail line continues to deteriorate. Existing rail line has 373 school bus crossings per day.	Vehicle delays, traffic congestion at grade crossings, and increased construction traffic may increase accidents.	A significant increase in accident frequency is expected at one crossing for the 50 MNT and 100 MNT levels of operation. Existing rail line has 373 school bus crossings per day.	Construction of 34 new grade crossings, vehicle delays, and detours would increase the risk of an accident.	Potential accident frequency would increase at new grade crossings. All increases are below the criteria for significance. Five new grade crossings used by school buses.	Impacts would be the same as those presented for Alternative R-3.	Impacts would be the same as those presented for Alternative R-3.	Impacts would be the same as those presented for Alternative R-3.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction
HAZARDOUS MATERIALS						
Transportation of Hazardous Materials	Potential risk of accidents would increase as rail line continues to deteriorate.	No impact expected.	Reconstruction of existing rail line would reduce the likelihood of an accidental spill of hazardous materials.	No impact expected.	Use of new rail line would decrease the risk of an accidental derailment.	No impact expected.
Hazardous Waste Sites	No impacts expected.	Disturbance of unknown sites in right-of-way may cause exposure to contamination.	Spills could occur in the event of a derailment or as a result of improper handling and storage of hazardous materials.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.
ENERGY RESOURCES						
Transportation of Energy Resources	No impacts expected.	No impacts expected.	Transportation of PRB coal would be more economical, reliable, and efficient.	No impacts expected.	Impacts would be similar to those presented for Alternative R-2.	No impacts expected.
						Impacts would be similar to those presented for Alternative R-2.

Table 5.1-10

**Summary of Environmental Impacts:
Rochester Alternatives**

Alternative	R-1	R-2		R-3		R-4	
Length	23.3 miles existing rail.	23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Utilization of Energy Resources	No impacts expected.	Fuel consumption would be increased due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.	Fuel savings and improved utilization of coal resources.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	23.3 miles existing rail.	23.3 miles of reconstruction.	No impacts expected.	23.3 miles of reconstruction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
CULTURAL RESOURCES								
Cultural Resources	No impacts expected.	48 historic structures, such as bridges and culverts, and two archeological site within the existing right-of-way could be damaged or lost.	No impacts expected.	Three structures identified in project area, one within the proposed right-of-way. None of the sites are on the NRHP. Resources located within the proposed new right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.	Impacts would be the same as those presented for Alternative R-3.	No impacts expected.	No impacts expected.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1	R-2		R-3		R-4
Length	23.3 miles existing rail.	23.3 miles of reconstruction.	34.1 miles of new construction.	34.1 miles of new construction.	34.1 miles of new construction.	
Action	Operation	Construction	Operation	Construction	Operation	Construction
SOCIOECONOMICS						
Socioeconomics	Failure to upgrade existing rail line could result in DM&E ceasing to be a viable railroad.	32 construction jobs created. Small number of relocations due to employment opportunities. Increased tax revenue. Increased use of local public facilities.	Increased tax revenues. High paying railroad jobs and decrease in local unemployment. Potential increase in local population. Public services could be improved.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.	Impacts would be similar to those presented for Alternative R-2.

Table 5.1-10
Summary of Environmental Impacts:
Rochester Alternatives

Alternative	R-1		R-2		R-3		R-4	
	Length		Length		Length		Length	
	23.3 miles existing rail.		23.3 miles of reconstruction.		34.1 miles of new construction.		34.1 miles of new construction.	
Action	Operation		Construction		Operation		Construction	
Viewsheds/Scenic Values	No impacts expected.		Ground disturbance and the presence of construction machinery would disrupt scenic views.		New rail structures would be more noticeable due to lack of weathering and clearing of vegetation; temporary effects.		Temporary disruption of scenery due to construction activity and equipment. Breakup of natural setting	
					Permanent change of rural landscape with addition of rail line and railroad facilities.		Impacts would be the same as those presented for Alternative R-3.	
							Impacts would be the same as those presented for Alternative R-3.	

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	13.3 miles	13.3 miles of reconstruction			14.5 miles of new construction	14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
GEOLOGY								
Soil Impacts	No impacts expected.	Disturbance of soil along 13.5 miles, approximately 327.3 acres, of existing rail line. Soil mixing, erosion, loss of productivity, and compaction. No loss of prime farmland.	Disturbance during maintenance. Potential contamination in the event of an accidental spill.	Approximately 659.4 acres of soil disturbed along the 14.5-mile bypass segment. Increased erosion, removal of vegetation, loss of productivity, soil compaction. Approximately 127.2 acres of prime farmland converted to rail line right-of-way.	Erosion and soil disturbance. Potential contamination in the event of an accidental spill..	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.
Paleontological Resources	No impacts expected.	No impacts expected.	No impacts expected.	Cut excavation associated with Big Sioux River crossing could encounter such resources.	No impacts expected.	Impacts would be similar to those presented for Alternative B-3.	No impacts expected.	No impacts expected.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
LAND USE								
Agriculture	No impacts expected.	Adjacent to approximately 10.2 miles of cropland and 5.6 miles of pasture and grassland. Soil compaction and fence damage. Loss of crops if encroaching on railroad right-of-way. Reduced access, inconvenience, and vehicle delays. Increased safety concerns. Potential contamination or crop damage in the event of an accidental spill.	Potential contamination or crop damage in the event of an accidental spill or derailment.	Approximately 284.8 acres of cropland and 2.5 acres of wooded fence rows lost. Approximately 127.2 acres of prime farmland lost. Soil mixing, erosion, and soil compaction. Potential crop damage. Reduced access, inconvenience, vehicle delays, increased safety concerns, and income loss. Potential contamination or crop damage in the event of an accidental spill.	Reduced access, safety concerns, and income loss. Potential contamination in the event of an accidental spill or derailment.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4	
	Length		Length		Length		Length	
	13.3 miles		13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation		Construction		Operation		Construction	
Residential	No impacts expected.		Adjacent to approximately 2.0 miles of residential land. Noise, dust, inconvenience, safety concerns, and vehicle delays.		Noise, dust, and safety concerns. More frequent vehicle delays.		Adjacent to approximately 0.36 miles of residential land. Removal or acquisition of 2 houses. Loss of approximately 4.4 acres of residential land. Noise, dust, inconvenience, safety concerns, and vehicle delays.	
					Noise, dust, safety concerns, and vehicle delays. Reduction in serenity of rural setting. Reduction in residential development.		Impacts would be similar to those for Alternative B-3.	
							Impacts would be similar to those for Alternative B-3.	

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4	
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Business and Industrial	No impacts expected.	Adjacent to approximately 3.8 miles of commercial land. Reduced access, safety concerns, potential interruption of rail service. Noise, dust, and vehicle delays. Inconvenience to workers and patrons. Potential for temporary reduction in business.	Noise, dust, and vehicle delays. Provide shippers access to modern rail service.	No impacts are expected due to the lack of commercial property in proximity to the proposed bypass.	Properties suitable for commercial development may increase in value. Potential impacts could include noise, dust, and vehicle delays.	No impacts expected.	Properties suitable for commercial development may increase in value. Potential impacts could include noise, dust, and vehicle delays.
Public Services	No impacts expected.	Vehicle delays, increased road traffic, and safety concerns. Inconvenience and reduced access. Rerouting required for closed crossings.	Increased noise and traffic delays.	Vehicle delays, reduced access, and inconvenience.	Inconvenience, vehicle delays, and reduced access. New routing may be required for emergency access.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	13.3 miles	13.3 miles of reconstruction			14.5 miles of new construction		14.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
PUBLIC LANDS								
Public Lands	No impacts expected.	No impacts expected.	No impacts expected.	Camp facilities located adjacent to proposed bypass. Increased noise, dust, safety concerns, and inconvenience in close proximity to proposed rail line.	Noise and safety concerns in proximity to proposed rail line.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.
WATER RESOURCES								
Surface Water	No impacts expected.	10 intermittent streams, one perennial water body, and Big Sioux River crossed. Increased sediment, stream modification, and potential loss of aquatic habitat. Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.	Increased sediment and erosion. Potential channelization and realignment of 19 intermittent or seasonal streams and the Big Sioux River. Change in hydrology. Potential contamination in the event of an accidental spills.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4	
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Wetlands	No impacts expected.	Loss of approximately 28.1 acres of emergent wetlands, 0.7 acres of aquatic beds, 0.8 acres of unconsolidated bottom, and 0.9 acres of riverine streambeds. Sedimentation, disturbance, and accidental spills could cause damage or loss of adjacent wetlands.	Alterations to drainage patterns could change hydrology and cause loss of adjacent wetlands. Degradation in the unlikely event of an accidental spill or derailment.	Loss of approximately 15.9 acres of emergent wetlands, 0.3 acres of aquatic beds, 1.8 acres of forested, and 0.9 acres of riverine streambeds. Changes in hydrology could cause loss of adjacent wetlands. Contamination could occur in the event of an accidental spill.	Alterations to drainage patterns could change hydrology and cause loss of adjacent wetlands. Degradation in the unlikely event of an accidental spill or derailment.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.
Groundwater	No impact expected.	Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction
AIR QUALITY						
Air Quality	Emissions would remain at current levels.	Temporary localized decrease in air quality due to emissions and dust.	Emissions level thresholds would be exceeded for NO _x at 50 and 100 MNT operating levels.	Increased particulate pollution, dust, and emissions.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-3.
					Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4	
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation	Construction	
NOISE AND VIBRATION							
Noise	No impacts expected.	Temporary increased in local noise levels from construction activities.	Increased noise receptors at 65 dBA 11 trains Wayside 0 Wayside/horn 115 Horn 547 21 trains Wayside 0 Wayside/horn 248 Horn 923 37 trains Wayside 0 Wayside/horn 423 Horn 1,335 70 dBA 11 trains Wayside 0 Wayside/horn 25 Horn 140 21 trains Wayside 0 Wayside/horn 110 Horn 384 37 trains Wayside 0 Wayside/horn 148 Horn 819	Impacts would be similar to those presented for Alternative B-2	Decreased noise receptors at 65 dBA 11 trains Wayside 0 Wayside/horn 23 Horn 201 21 trains Wayside 0 Wayside/horn 23 Horn 195 37 trains Wayside 0 Wayside/horn 22 Horn 192 70 dBA 11 trains Wayside 0 Wayside/horn 1 Horn 218 21 trains Wayside 0 Wayside/horn 1 Horn 217 37 trains Wayside 0 Wayside/horn 1 Horn 212	Impacts would be similar to those presented for Alternative B-2	Decreased noise receptors at 65 dBA 11 trains Wayside 0 Wayside/horn 20 Horn 512 21 trains Wayside 0 Wayside/horn 20 Horn 506 37 trains Wayside +1* Wayside/horn 19 Horn 502 70 dBA 11 trains Wayside 0 Wayside/horn 1 Horn 356 21 trains Wayside 0 Wayside/horn 1 Horn 344 37 trains Wayside +1* Wayside/horn +1* Horn 341 (*increase)

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4	
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Vibration	No impacts expected.	Minor vibration may be experienced during construction activities.	Potential damage to 6 structures located within 100 feet of the rail line. Inconvenience to 320 structures located between 101-400 feet.	Impacts would be similar to those presented for Alternative B-2.	Potential damage to 2 structures located within 100 feet of the proposed bypass. Inconvenience to 2 structures located between 201-400 feet.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-3.

Table 5.1-11

**Summary of Environmental Impacts:
Brookings Alternatives**

Alternative	B-1	B-2		B-3		B-4
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction
BIOLOGICAL RESOURCES						
Vegetation	No impacts expected.	Adjacent to approximately 5.6 miles of grassland, 1.3 miles of wooded fence rows, 1.3 miles of wetlands, and 10.2 miles of cropland. Clearing, damage by construction equipment and herbicide use, trimming and mowing, and ground disturbance. Potential loss or damage in the event of an accidental spill.	Disturbance during maintenance activities. Potential loss or damage of vegetation in adjacent areas and the right-of-way in the event of an accidental spill. Noxious weeds may become established in disturbed areas.	Loss of approximately 89.6 acres of grassland, 9.7 acres of wooded fence rows, 284.8 acres of cropland, and 18.9 acres of wetland vegetation. Soil disturbance, reduced productivity, and potential contamination of soil.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-3.
					Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction
WILDLIFE						
Wildlife	No impacts expected.	Disturbance from increased noise and human activity. Displacement, habitat loss, and increased mortality. Potential degradation of habitat in the event of an accidental spill.	Noise disturbance. Mortality from collisions with trains.	Displacement. Loss of habitat. Disturbance from increased noise and human activity. Increased mortality due to collision with vehicles and machinery. Potential degradation of habitat in the event of an accidental spill.	Mortality from wildlife/train collisions. Noise disturbance, potential habitat abandonment.	Impact would be similar to those presented for Alternative B-3.
						Impact would be similar to those presented for Alternative B-3.

Table 5.1-11

**Summary of Environmental Impacts:
Brookings Alternatives**

Alternative	B-1	B-2		B-3		B-4
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction

AQUATICS AND FISHERIES

Aquatics and Fisheries	No impacts expected.	Alteration or loss of available habitat. Increased sediment and reduced food resources. Changes in hydrology, changes of natural movements and migration patterns. Accidental spills could pose hazards to aquatic organisms.	Potential contamination in the event of an accidental spill or derailment.	Increased TSS in 19 intermittent or seasonal streams and the Big Sioux River. Potential changes in hydrology, loss of habitat, changes of natural movements and migration patterns, sedimentation, and reduced food resources. Accidental spills could pose hazards to aquatic organisms.	Potential disturbance and habitat abandonment. Potential contamination in the event of an accidental spill or derailment.	Impact would be similar to those presented for Alternative B-3.
						Impact would be similar to those presented for Alternative B-3.

Table 5.1-11

**Summary of Environmental Impacts:
Brookings Alternatives**

Alternative	B-1	B-2		B-3		B-4
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction
TRANSPORTATION						
Transportation	No impacts expected.	Temporary closures at 18 grade crossings. Vehicle delays, reduced access, rerouting, and traffic congestion. Increased wear and tear on local roadways.	More frequent vehicle delays. Three grade crossings with ADTs above 5000 would experience a reduction in delay per stopped vehicle. No grade crossings would experience a level of service below C.	Construction of grade crossings on 31 roadways. Vehicle delays, detours, inconvenience, and traffic congestion. Increased wear and tear on local roadways.	Vehicle delays at newly constructed grade crossings along bypass segment. No grade crossings would experience a level of service below C.	Impact would be similar to those presented for Alternative B-3.
						Impact would be similar to those presented for Alternative B-3.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative		B-1		B-2		B-3		B-4	
Length		13.3 miles		13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action		Operation		Construction		Operation		Construction	
Operation		Operation		Construction		Operation		Construction	
Construction		Construction		Construction		Construction		Construction	
Operation		Operation		Operation		Operation		Operation	
Construction		Construction		Construction		Construction		Construction	
SAFETY									
Safety	No impacts expected.	Congestion and increased safety concerns. Routes for emergency vehicles redesigned to avoid delays.	Increased train speed and frequency of rail traffic would increase incidence of safety hazards for motorists and pedestrians. Risk of derailment would decrease. Accident frequency rates would be below the criteria for significance. Existing rail line has 68 school bus crossings per day.	Impacts would be similar to those presented for Alternative B-2.	Safety concerns at new grade crossings, vehicle delays. The potential for accidents significantly impacted at one grade crossing. Emergency vehicle establishment of new routes to avoid delay. Proposed bypass segment has 32 school bus crossings per day, existing rail line has 68 school bus crossings per day.	Impacts would be similar to those presented for Alternative B-2.	Safety concerns at new grade crossings, vehicle delays. The potential for accidents significantly impacted at 2 grade crossings at 20 MNT; 4 at 50 MNT; and 5 at 100 MNT. Establishment of new routes for emergency vehicles. Proposed bypass segment has 32 school bus crossings per day.		

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4
		Construction	Operation	Construction	Operation	
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Operation
HAZARDOUS MATERIALS						
Transportation of Hazardous Materials	Potential risk of accidents increased as rail line continues to deteriorate.	No impacts expected.	Reconstruction of existing rail line would reduce the likelihood of an accidental spill of hazardous materials.	No impacts expected.	Use of new rail line would decrease the risk of an accidental derailment.	Impacts would be the same as those presented for Alternative B-3.
Hazardous Waste Sites	No impacts expected.	Disturbance of unknown sites may cause exposure to contamination. Improper handling or storage of hazardous materials could result in contamination.	Spills could occur in the event of a derailment or as a result of improper handling and storage of hazardous materials.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.	Impacts would be similar to those presented for Alternative B-2.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4					
	13.3 miles		13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction					
Action	Operation		Construction		Operation		Construction		Operation			
ENERGY RESOURCES												
Transportation of Energy Resources	No impacts expected.		No impacts expected.		Transportation of PRB coal would be more economical, reliable, and efficient.		No impacts expected.		No impacts expected.		Impacts would be similar to those presented for Alternative B-2.	
Utilization of Energy Resources	No impacts expected.		Fuel consumption increased due to use by construction equipment, transportation of materials, and delayed or rerouted rail and road traffic.		Fuel savings and improved utilization of coal resources.		Impacts would be similar to those presented for Alternative B-2.		Impacts would be similar to those presented for Alternative B-2.		Impacts would be similar to those presented for Alternative B-2.	

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4	
	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
Length	13.3 miles	13.3 miles of reconstruction			14.5 miles of new construction	14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation	Construction
CULTURAL RESOURCES								
Cultural Resources	No impacts expected.	No impacts expected.	No impacts expected.	Two sites considered ineligible for listing with NRHP within the proposed right-of-way. Resources located within the proposed right-of-way may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.	Impacts would be similar to those presented for Alternative B-3.	No impacts expected.	No impacts expected.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction
Action	Operation	Construction	Operation	Construction	Operation	Construction
SOCIOECONOMICS						
Socioeconomics	No impacts expected.	Creation of 62 construction jobs and an estimated 30 indirect jobs. Small number of relocations due to employment opportunities. An estimated \$9.2 million in construction earnings and approximately \$1.0 million in sales and use taxes in South Dakota. Increased use of public facilities.	Increased tax revenue. High paying railroad jobs available. Decrease in local unemployment and increased demand for housing. Public services improved.	Impacts would be the same as presented for Alternative B-2.	Impacts would be the same as presented for Alternative B-2.	Impacts would be the same as presented for Alternative B-2.

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1		B-2		B-3		B-4	
Length	13.3 miles		13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation		Construction		Operation		Construction	
RECREATION								
Recreation	No impacts expected.		Increased noise, dust, vehicle delays, and safety concerns in proximity to the rail line. Temporary closure, detours, and decreased use of three trails which cross the rail line. Visual impacts due to the presence of machinery and ground disturbance.		Inconvenience, vehicle delays, and increased noise disturbance in proximity to the rail line. Increased safety concerns at crossings.		Disturbance, inconvenience, noise, dust, and vehicle delays in proximity to the rail line. Increased safety concerns at crossings. Visual impacts due to the presence of machinery and ground disturbance.	
					Impacts would be similar to those presented for Alternative B-2.		Impacts would be similar to those presented for Alternative B-3.	
							Impacts would be similar to those presented for Alternative B-2.	
AESTHETICS								
Wild and Scenic Rivers	No impacts expected.		No impacts expected.		No impacts expected.		No impacts expected.	
							No impacts expected.	

Table 5.1-11
Summary of Environmental Impacts:
Brookings Alternatives

Alternative	B-1	B-2		B-3		B-4	
Length	13.3 miles	13.3 miles of reconstruction		14.5 miles of new construction		14.5 miles of new construction	
Action	Operation	Construction	Operation	Construction	Operation	Construction	Operation
Viewsheds/Scenic Values	Deteriorated rail corridor could create perception of area that is unkempt and dilapidated.	Ground disturbance and the presence of construction machinery would disrupt scenic views.	New structures would be more noticeable due to lack of weathering and vegetation.	Impacts would be similar to those presented for Alternative B.	Scenic value of undeveloped agricultural area diminished.	Impacts would be similar to those presented for Alternative B-3.	Impacts would be similar to those presented for Alternative B-3.

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

[illegible]

<p>Table 5.1-12 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on Minnesota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
LAND USE						
Agriculture	Option A Approximately 328.7 acres of agriculture land lost. Option B Approximately 328.1 acres of agriculture land lost.	No impacts expected.	Option A Approximately 346.2 acres of agriculture land lost. Option B Approximately 342.4 acres of agriculture land lost.	No impacts expected.	Approximately 381.9 acres of agriculture land lost.	No impacts expected.
	Approximately 17.5 acres of wooded fence rows and wood lots cleared. Approximately 12.8 acres of wooded fence rows and wood lots cleared.		Approximately 19.9 acres of wooded fence rows and wood lots cleared. Approximately 12.8 acres of wooded fence rows and wood lots cleared.		Approximately 10.5 acres of wooded fence rows and wood lots cleared.	

<p>Table 5.1-12 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on Minnesota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Residential	<p>Option A Approximately 1.0 acres of residential land within proposed yard sites. 22 houses within 500 feet of proposed yards, and 1 house within the proposed rail yard site removed or converted to railroad use.</p> <p>Option B Approximately 1.6 acres of residential land within proposed yard sites. 17 houses within 500 feet of proposed yards. Two houses within the proposed rail yard site removed or converted to railroad use.</p>	Inconvenience due to road closures and increased noise.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Approximately 1.2 acres of residential land within proposed yard sites. 8 houses within 500 feet of proposed yards. Two houses within the proposed rail yard site removed or converted to railroad use.	Impacts would be similar to those presented for Alternative B.

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

[illegible]

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Public Parks	<p>Option A. Increased dust and noise disturbance. Vehicle delays. Statutory boundary for Minneopa State Park adjacent to the proposed rail yard. Disturbance of park users and wildlife. Loss of habitat for wildlife. Reduced use of park facilities in proximity to construction.</p> <p>Option B. No impacts expected.</p>	<p>Increased noise, dust, and vehicle delays. Disturbance of park users in proximity to rail yards. Crowding in areas farther from rail yards. Possible decreased use and loss of revenue.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>	<p>No impacts expected.</p>	<p>No impacts expected.</p>

<p>Table 5.1-12 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on Minnesota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
WATER RESOURCES						
Surface Water	<p>Channelization and stream bank modifications. Increased sediment. Potential contamination in the event of an accidental spill.</p> <p>Option A. 7 intermittent streams crossed.</p> <p>Option B. 3 intermittent streams crossed. Cottonwood River crossed one time.</p>	<p>Scouring and erosion of streams. Potential contamination due to run-off, accidental spills, or improper handling of hazardous materials.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>	<p>Channelization and stream bank modifications. Increased sediment. Potential contamination in the event of an accidental spill. 4 intermittent streams crossed.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Wetlands	Potential disturbance or damage of adjacent wetland areas. Option A. Approximately 1.0 acres of palustrine emergent wetland, 0.9 acres of forested, and 1.8 acres of scrub/shrub wetland lost. Option B. Approximately 5.2 acres of palustrine emergent wetland, and 9.0 acres of scrub/shrub wetland lost.	Adjacent wetlands altered or lost due to changes in hydrology, or potentially damaged in the event of an accidental discharge of hazardous materials from rail yards.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Approximately 8.7 acres of palustrine emergent wetlands and 1.8 acres of forested wetlands lost. Potential disturbance or damage of adjacent wetland areas.	Impacts would be similar to those presented for Alternative B.
Groundwater	Potential contamination during construction in the event of an accidental spill or improper handling of hazardous materials.	Potential contamination during operation in the event of an accidental spill or improper handling of hazardous materials.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
AIR QUALITY						
Air Quality	Temporary reduction in local air quality due to construction activities, fugitive dust, and equipment emissions.	Thresholds exceeded for CO at 100 MNT and NO _x at all operating levels in the East Yard and Waseca Yard; and NO _x at 50 and 100 MNT in the Middle East Yard.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
NOISE AND VIBRATION						
Noise	Temporary increase in local noise levels.	Increased local noise from yard operations and idling locomotives. Minimal increase to noise receptors. Option A 22 noise receptors within 500 feet. Option B. 17 noise receptors within 500 feet.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B. 11 noise receptors within 500 feet

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Vibration	Minor increase in local vibration levels.	No known facilities likely to use sensitive equipment within 400 feet. Option A. Inconvenience to 22 structures within 500 feet of proposed rail yard. No structures within 100 feet. Option B. Inconvenience to 17 structures within 500 feet.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Potential structural damage to one structure within 100 feet of the proposed rail yard. Inconvenience to 10 structures within 500 feet. No known facilities likely to use sensitive equipment within 400 feet.

<p>Table 5.1-12 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on Minnesota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
BIOLOGICAL RESOURCES						
Vegetation	<p>Potential disturbance to adjacent vegetation.</p> <p>Option A. Approximately 243.3 acres of cropland, 17.5 acres of woody vegetation, 86.0 acres of grassland, and 3.7 acres of wetland vegetation lost.</p> <p>Option B. Approximately 328.0 acres of cropland, 12.8 acres of woody vegetation, and 14.2 acres of wetland vegetation lost.</p>	<p>Mowing and trimming around yard perimeter. Potential damage due to leakage of accidental spills or herbicide use. Introduction of noxious weeds in disturbed areas.</p>	<p>Potential disturbance to adjacent vegetation.</p> <p>Option A. Approximately 257.8 acres of cropland, 17.5 acres of woody vegetation, 86.0 acres of grassland, and 3.7 acres of wetland vegetation lost.</p> <p>Option B. Approximately 342.5 acres of cropland, 12.8 acres of woody vegetation, and 14.2 acres of wetland vegetation lost.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>	<p>Approximately 367.3 acres of cropland, 10.5 acres of woody vegetation, 14.6 acres of grassland, and 10.5 acres of wetland vegetation lost. Potential disturbance to adjacent vegetation.</p>	<p>Impacts would be similar to those presented for Alternative B.</p>

Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

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Table 5.1-12
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
TRANSPORTATION						
Transportation	Vehicle delays, inconvenience, rerouted traffic. Reduced access. Increased wear and tear on local roads. Option A. 4 public roadways with low ADTs re-routed or terminated. Option B. 3 public roadways with low ADTs re-routed or terminated.	Vehicle delays, congestion, and increased safety concern on local roadways. Permanent detour of traffic to new routes.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Vehicle delays, inconvenience, rerouted traffic. Reduced access. Increased wear and tear on local roads. 7 public roadways with low ADTs re-routed or terminated. Control device installed at Highway 12 crossing for East Yard.	Impacts would be similar to those presented for Alternative B.
SAFETY						
Safety	Increased risk of accident due to rerouted traffic and the presence of construction vehicles on local roadways. Reduced access of emergency vehicles.	Increase in traffic levels may increase risk of accidents on local roadways. Reduced access of emergency vehicles.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-12

**Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on Minnesota Rebuild**

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
HAZARDOUS MATERIALS						
Transportation of Hazardous Materials	No increase in the amount or type of hazardous materials transported by DM&E.	No increase in the amount or type of hazardous materials transported by DM&E.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Hazardous Waste Sites	Disturbance of unknown sites may cause exposure to contamination.	Potential contamination in the event of an accidental spill or improper handling of hazardous substances.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
ENERGY RESOURCES						
Transportation of Energy Resources	No impacts expected.	All rail yards would facilitate the efficient transportation of energy resources.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Utilization of Energy Resources	No impacts expected.	More efficient rail line and rail facilities would facilitate better use of energy resources.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

<p>Table 5.1-12 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on Minnesota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
CULTURAL RESOURCES						
Cultural Resources	No known sites. Any resources located within the proposed yard site may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.
SOCIOECONOMICS						
Socioeconomics	Approximately 119 two-year jobs created. Small number of relocations due to employment opportunities. Increased tax revenue. Increased use of local public facilities.	Approximately 365-450 jobs at full operating level. Estimated \$18 million in earnings at full operation and an estimated \$2.2 million in tax revenues paid. Potential increase in local populations. Improvement of public services.	Impacts would be the same as those presented for Alternative B.	Impacts would be the same as those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

<p>Table 5.1-12 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on Minnesota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
RECREATION						
Recreation	<p>Option A. Increased dust and noise disturbance. Vehicle delays. Statutory boundary for Minnesota State Park adjacent to the proposed rail yard. Disturbance of park users. Reduced use of park facilities in proximity to construction.</p> <p>Option B. No impacts expected.</p>	Increased noise, dust, and vehicle delays. Disturbance of park users in proximity to rail yards. Crowding in areas farther from rail yards. Possible decreased use.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	No impacts expected.
AESTHETICS						
Wild and Scenic Rivers	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Viewsheds/Scenic Values	Ground disturbance and the presence of construction equipment would disrupt local scenery.	The presence of rail yards would change the appearance of local scenery.	Impacts would be the same as those presented for Alternative B.	Impacts would be the same as those presented for Alternative B.	Impacts would be the same as those presented for Alternative B.	Impacts would be the same as those presented for Alternative B.

<p align="center">Table 5.1-13 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on South Dakota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
GEOLOGY						
Unique Geological Formations	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Geological Hazards	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Soil Impacts	Approximately 730.9 acres of soil converted to rail yard facility. No prime farmland lost. Increased erosion and runoff.	Potential contamination in the event of an accidental spill or improper handling of hazardous materials.	Approximately 606.1 acres of soil converted to railroad right-of-way. No prime farmland lost. Increased erosion and runoff.	Impacts would be similar to those presented for Alternative B.	Approximately 509.0 acres of soil converted to rail yard facility. Approximately 246.0 acres of prime farmland lost. Increased erosion and runoff.	Impacts would be similar to those presented for Alternative B.
Paleontological Resources	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
LAND USE						
Agriculture	Approximately 661.1 acres of agriculture land lost. Potential loss or damage of crops. Reduced access to fields, inconvenience.	No impacts expected.	Approximately 535.8 acres of agriculture land lost. Impacts would be similar to those presented for Alternative B.	No impacts expected.	Approximately 394.3 acres of agriculture land lost. Impacts would be similar to those presented for Alternative B.	No impacts expected.

Table 5.1-13
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild

[illegible]

Table 5.1-13
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
PUBLIC LANDS						
Federal Lands	66.4 acres of USFWS wetland easement converted to rail yard facility. Noise. Ground and vegetation disturbance.	No impacts expected.	Increased dust and sediment could affect Waterfowl Production area. Noise disturbance.	Presence of rail yard within 4,000 feet of a National Waterfowl Production Area could change hydrology and affect wetlands.	No impacts expected.	No impacts expected.
Public Parks	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
WATER RESOURCES						
Surface Water	3 intermittent streams crossed. 3 small stock ponds within one proposed yard. Channelization and stream bank modifications. Increased sediment and erosion. Potential contamination in the event of an accidental spill.	Scouring and erosion of streams. Potential contamination due to run-off, accidental spills, or improper handling of hazardous materials.	Potential contamination in the event of an accidental spill	Potential contamination due to run-off, accidental spills, or improper handling of hazardous materials.	5 intermittent streams crossed. Run-off during construction could increase sediment in the Bad River, Lake Whitewood, and two lakes. Approximately 59 acres of Lake Preston could require alteration.	Impacts would be the same as those presented for Alternative B.

Table 5.1-13
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Wetlands	Approximately 77.2 acres of palustrine emergent wetlands lost. Potential damage or loss in the event of an accidental spill.	Changes in hydrology could affect adjacent wetlands. Potential damage or loss in the event of an accidental spill or improper handling of hazardous materials.	Approximately 65.7 acres of palustrine emergent wetlands lost. Potential damage or loss in the event of an accidental spill.	Impacts would be similar to those presented for Alternative B.	Approximately 91.7 acres of palustrine emergent wetlands lost. Potential damage or loss in the event of an accidental spill.	Impacts would be similar to those presented for Alternative B.
Groundwater	Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or improper handling of hazardous materials.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
AIR QUALITY						
Air Quality	Temporary reduction in local air quality due to construction activities, fugitive dust, and equipment emissions.	Thresholds exceeded for HC, CO, NO _x , and SO ₂ at all operating levels; PM ₁₀ at 50 and 100 MNT for the Central Yard; CO at 100 MNT and NO _x at all operating levels for the Middle West Yard.	Impacts would be similar to those presented for Alternative B.	Thresholds exceeded for CO and NO _x at all operating levels for Central Yard	Impacts would be similar to those presented for Alternative B.	Thresholds exceeded for CO and NO _x at all operating levels for Middle West Yard; CO at 100 MNT and NO _x at all operating levels for the Middle Yard.

Table 5.1-13

**Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild**

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
NOISE AND VIBRATION						
Noise	Temporary increase in local noise levels.	Increased noise from yard operations and idling locomotives. Minimal increase in noise receptors expected. 28 noise receptors within 500 feet.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B. 21 noise receptors within 500 feet.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B. 26 noise receptors within 500 feet.
Vibration	Minor increase in local vibration levels.	Potential structural damage to 2 structures located within 100 feet; Inconvenience to 26 structures within 500 feet of proposed rail yard. No known facilities likely to use sensitive equipment within 400 feet.	Impacts would be similar to those presented for Alternative B.	Inconvenience to 21 structures located within 500 feet of the proposed rail facilities. No known hospitals or facilities likely to use sensitive equipment within 400 feet.	Impacts would be similar to those presented for Alternative B.	Potential structural damage to one structure located within 100 feet; Inconvenience to 25 structures located within 500 feet of the proposed rail yards. No known facilities likely to use sensitive equipment within 400 feet.

<p align="center">Table 5.1-13 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on South Dakota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
BIOLOGICAL RESOURCES						
Vegetation	Approximately 610.3 acres of cropland, and 50.8 acres of grassland, and 77.2 acres of wetland vegetation lost. Potential damage to vegetation in adjacent areas.	Mowing and trimming around yard perimeter. Potential damage or disturbance of vegetation in adjacent areas during maintenance. Potential damage due to leakage of accidental spills or herbicide use. Introduction of noxious weeds in disturbed areas.	Approximately 535.8 acres of cropland and 65.7 acres of wetland vegetation lost. Damage may occur to vegetation in adjacent areas.	Impacts would be similar to those presented for Alternative B.	Approximately 284.0 acres of cropland, 3.7 acres of woody vegetation, 50.8 acres of grassland, and 91.7 acres of wetland vegetation lost. Vegetation may be damaged in adjacent areas.	Impacts would be similar to those presented for Alternative B.
Wildlife						
Wildlife	Loss of habitat, disturbance due to noise and human presence. Mortality due to hunting, poaching, and machinery and vehicle operation. Nest loss for ground and tree nesting birds.	Disturbance from noise and human activity. Mortality or injury within yard boundaries. Potential contamination in the event of leakage of accidental spill.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-13
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Aquatic Resources and Fisheries	Temporary increase in TSS. 3 intermittent streams and 3 stock ponds within yard boundaries. Loss of habitat.	Potential change in hydrology. Potential contamination from surface water run-off.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Sensitive, Threatened and Endangered Species						
Sensitive, Threatened and Endangered Species	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
TRANSPORTATION						
Transportation	Vehicle delays, inconvenience, rerouted traffic. 8 public roadways with low ADTs re-routed or terminated.	Vehicle delays, congestion, and increased safety concern on local roadways. Permanent detour of traffic to new routes.	7 public roadways with low ADTs re-routed or terminated. Impacts would be similar to those presented under Alternative B	Impacts would be similar to those presented for Alternative B.	3 public roadways with low ADTs re-routed or terminated. Bad River Road affected by delays and temporary closures.	Impacts would be similar to those presented for Alternative B.

<p>Table 5.1-13 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards on South Dakota Rebuild</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
SAFETY						
Safety	Increased risk of accident due to re-routed traffic and the presence of construction vehicles on local roadways. Reduce access of emergency vehicles.	Increase in traffic levels may increase risk of accidents on local roadways. Reduce access of emergency vehicles.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
HAZARDOUS MATERIALS						
Transportation of Hazardous Materials	No increase in the amount or type of hazardous materials transported by DM&E.	No increase in the amount or type of hazardous materials transported by DM&E.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Hazardous Waste Sites	Disturbance of unknown sites may cause exposure to contamination.	Potential contamination in the event of an accidental spill or improper handling of hazardous substances.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
ENERGY RESOURCES						
Transportation of Energy Resources	No impacts expected.	All rail yards would facilitate the efficient transportation of energy resources.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.

Table 5.1-13

**Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild**

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Utilization of Energy Resources	No impacts expected.	More efficient rail line and rail facilities would facilitate better use of energy resources.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.
CULTURAL RESOURCES						
Cultural Resources	No known sites. Any resources located within the proposed yard site may be recovered and scientific information acquired. Possible loss of resources due to inadvertent discovery.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.
SOCIOECONOMICS						
Socioeconomics	Approximately 117 two year jobs created. Small number of relocations due to employment opportunities. Increased tax revenue. Increased use of local public facilities.	Approximately 240-350 jobs at full operating level. Estimated \$12 million per year in earning at full operation, and estimated \$1.2 million in tax revenues paid. Potential increase in local populations. Improvement of public services.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-13
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards on South Dakota Rebuild

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
RECREATION						
Recreation	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
AESTHETICS						
Wild and Scenic Rivers	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Viewsheds/ Scenic Values	Ground disturbance and the presence of construction equipment would disrupt local scenery.	The presence of a rail yard would change the appearance of local scenery.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-14
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards in South Dakota and Wyoming

[illegible]

<p>Table 5.1-14 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards in South Dakota and Wyoming</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
LAND USE						
Agriculture	Loss of approximately 542.0 acres of rangeland. Loss of grazing areas and forage acreage, relocation of livestock, reduced access, and inconvenience to ranchers and farmers.	Reduced access and inconvenience.	Loss of approximately 1,048.7 acres of rangeland and cropland. Impacts would be similar to those presented for Alternative B.	Reduced access and inconvenience.	Loss of approximately 927.9 acres of rangeland and cropland. Impacts would be similar to those presented for Alternative B.	Reduced access and inconvenience.
Residential	No residences are located within 500 feet of the proposed yards. Seven residences are located within 500 feet of the proposed interchange in Edgemont. Increased noise, dust, traffic delays, inconvenience, and reduced access.	Increased noise and increased frequency of vehicle delays. Reduced access in proximity to proposed railroad facility.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Nine residences located within 500 feet. Increased noise, fugitive dust, inconvenience, vehicle delays, road closures, and reduced access. Increased safety concerns.	Inconvenience due to road closures and increased noise.
Business and Industrial	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Minerals and Mining	May increase demand for suitable materials.	Facilitate project providing additional access to PRB coal.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-14
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards in South Dakota and Wyoming

[illegible]

<p>Table 5.1-14 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards in South Dakota and Wyoming</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
WATER RESOURCES						
Surface Water	9 intermittent streams crossed. Channelization and stream bank modifications. Increased sediment and erosion. Potential contamination in the event of an accidental spill.	Scouring and erosion of streams. Potential contamination due to run-off, accidental spills, or improper handling of hazardous materials.	Impacts would be similar to those presented for Alternative B. Option A. 22 intermittent streams crossed. Option B. 7 intermittent streams crossed.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B. 15 intermittent streams crossed.	Impacts would be similar to those presented for Alternative B.
Wetlands	Approximately 0.5 acres of palustrine emergent wetland lost. Potential damage or loss of adjacent wetlands in the event of an accidental spill.	Adjacent wetlands lost or damaged by changes in hydrology or in the event of an accidental spill or improper handling of hazardous substances.	Approximately 0.6 acres of palustrine emergent wetland lost. Potential damage or loss of adjacent wetlands in the event of an accidental spill.	Impacts would be similar to those presented for Alternative B.	Approximately 0.5 acres of palustrine emergent wetland lost. Potential damage or loss of adjacent wetlands in the event of an accidental spill.	Impacts would be similar to those presented for Alternative B.
Groundwater	Possibility of contamination in the event of an accidental spill.	Possibility of contamination in the event of an accidental spill or improper handling of hazardous substances.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-14
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards in South Dakota and Wyoming

Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
AIR QUALITY						
Air Quality	Temporary reduction in local air quality due to construction activities, fugitive dust, and equipment emissions.	Threshold exceeded for NO _x at all operation levels.	Impacts would be similar to those presented for Alternative B.	Threshold exceeded for NO _x at all operation levels; CO at 100 MNT for the West Yard. Threshold levels for NO _x exceeded at 50 and 100 MNT for the Middle West Yard.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative C.
NOISE AND VIBRATION						
Noise	Temporary increase in local noise levels.	Increased noise from yard operations and idling locomotives. Minimal increase in noise receptors expected. 7 noise receptors within 500 feet.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B. 9 noise receptors within 500 feet.
Vibration	Minor vibrations may be experienced during construction activities.	Inconvenience to 7 structures located between 201-500 feet from proposed connection. No known facilities likely to use sensitive equipment within 400 feet.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Inconvenience to 9 structures located between 201-500 feet from proposed rail yard. No known facilities likely to use sensitive equipment within 400 feet.

<p>Table 5.1-14 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards in South Dakota and Wyoming</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
BIOLOGICAL RESOURCES						
Vegetation	Approximately 542.0 acres of grassland vegetation and 0.5 acres of wetland vegetation lost. Potential loss or damage to vegetation in adjacent areas.	Mowing and trimming around yard perimeter. Potential damage due to leakage of accidental spills or herbicide use. Introduction of noxious weeds in disturbed areas.	Approximately 1,048.7 acres of grassland vegetation and 0.6 acres of wetland vegetation lost. Damage may occur to vegetation in adjacent areas.	Impacts would be similar to those presented for Alternative B.	Approximately 927.9 acres of grassland vegetation and 0.5 acres of wetland vegetation lost. Damage may occur to vegetation in adjacent areas.	Impacts would be similar to those presented for Alternative B.
Wildlife						
Wildlife	Loss of habitat, disturbance due to noise and human presence. Mortality due to hunting, poaching, and machinery and vehicle operation. Nest loss for ground nesting birds.	Disturbance from noise and human activity. Mortality or injury within yard boundaries. Potential contamination in the event of leakage or accidental spill	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Aquatic Resources and Fisheries	Temporary increase in TSS. Loss of habitat.	Potential change in hydrology. Potential contamination from surface run-off.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

<p>Table 5.1-14 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards in South Dakota and Wyoming</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
Sensitive, Threatened and Endangered Species						
Sensitive, Threatened and Endangered Species	Sturgeon chub may be affected by potential habitat loss and increased sediment at Cheyenne River crossings. Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill.	Swift fox and mountain plovers may be affected by habitat loss and displacement. Disturbance due to noise and human activity. Mortality due to collision with vehicles.	Disturbance due to noise and human activity. Mortality due to collision with trains.	Impacts would be similar to those presented for Alternative C.	Impacts would be similar to those presented for Alternative C.
TRANSPORTATION						
Transportation	Increased wear and tear on local roadways. Termination or rerouting of roadways. Vehicle delays, detours inconvenience.	Inconvenience to some motorists.	2 public roadways with low ADTs re-routed or terminated. Vehicle delays, congestion, inconvenience, and increased safety concerns.	Inconvenience and increased safety concerns. Permanent detour of road traffic to new routes.	Impacts would be similar to those presented for Alternative C.	Impacts would be similar to those presented for Alternative C.
SAFETY						
Safety	Increased risk of accidents on local roadways due to increased traffic and the presence of construction vehicles. Reduced access of emergency vehicles	Reduced access of emergency vehicles.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

<p>Table 5.1-14 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards in South Dakota and Wyoming</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
HAZARDOUS MATERIALS						
Transportation of Hazardous Materials	No increase in the amount or type of hazardous materials transported by DM&E.	No increase in the amount or type of hazardous materials transported by DM&E.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
Hazardous Waste Sites	Disturbance of unknown sites may cause exposure to contamination.	Potential contamination in the event of an accidental spill of improper handling of hazardous substances.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.
ENERGY RESOURCES						
Transportation of Energy Resources	No impacts expected.	All rail yards would facilitate the efficient transportation of energy resources.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.
Utilization of Energy Resources	No impacts expected.	More efficient rail line and rail facilities would facilitate better use of energy resources.	No impacts expected.	Impacts would be similar to those presented for Alternative B.	No impacts expected.	Impacts would be similar to those presented for Alternative B.

Table 5.1-14
Summary of Environmental Impacts:
Proposed Staging and Marshaling Yards in South Dakota and Wyoming

[illegible]

<p>Table 5.1-14 Summary of Environmental Impacts: Proposed Staging and Marshaling Yards in South Dakota and Wyoming</p>						
Evaluation Criteria	Alternative B		Alternative C		Alternative D	
	Construction	Operation	Construction	Operation	Construction	Operation
AESTHETICS						
Wild and Scenic Rivers	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Viewsheds/ Scenic Values	Ground disturbance and the presence of construction equipment would disrupt local scenery.	The presence of a rail yard would change the appearance of local scenery.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.	Impacts would be similar to those presented for Alternative B.

Table 5.1-15 Summary of Environmental Impacts: Missouri River Bridge						
Alternative	Rehabilitation of Existing Bridge		New Construction/New Ownership		New Construction/ Removal	
Length	2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction		Operation		Construction	Operation
GEOLOGY						
Unique Geological Formations	No impacts expected.		No impacts expected.		No impacts expected.	
Geological Hazards	No impacts expected.		No impacts expected.		No impacts expected.	
Soil Resources	Potential contamination of soils along river bank and bridge ends in the event of an accidental spill.		Potential contamination of soils along river bank and bridge ends in the event of an accidental spill or derailment.		Potential contamination of soils along river bank and bridge ends in the event of an accidental spill or derailment.	
			Potential disturbance during construction of approaches for new bridge. Loss of topsoil and potential erosion during realignment of bridge adjacent to existing bridge. Potential contamination of soils along river bank and bridge ends in the event of an accidental spill.		Impacts would be similar to those presented for New Construction/New Ownership, except removal of existing bridge structures would also likely disturb soil and increase erosion due to removal of existing bridge approaches.	

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Alternative	Rehabilitation of Existing Bridge		New Construction/ New Ownership		New Construction/ Removal	
Length	2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Paleontological Resources	No impacts expected.	No impacts expected.	Resources and scientific information may be acquired during project construction activity along river bank and in-stream in the unlikely event they are encountered. Possible loss of resources due to inadvertent discovery.	No impacts expected.	Impacts would be similar to those presented for New Construction with New Ownership.	No impacts expected.
LAND USE						
Agriculture	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected
Residential	6 residences within 500 feet of bridge. Noise disturbance, reduced access.	Increased frequency of noise disturbance.	10 residences within 500 feet of proposed bridge. Noise disturbance, reduced access.	Increased frequency of noise disturbance.	Impacts would be similar to those presented for New Construction with New Ownership, except bridge removal would increase duration of disturbance due to construction and removal activities.	Increased frequency of noise disturbance.

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Alternative	Rehabilitation of Existing Bridge	New Construction/ New Ownership		New Construction/ Removal
Length	2,056 feet of reconstruction and reinforcement of existing structures.	2,056 feet of new construction, retention of existing bridge for new use.	2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation
Business and Industrial	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Minerals and Mining	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
FEDERAL LANDS				
U.S. Army Corps of Engineers	Reduced use and access during bridge rehabilitation activities.	No impacts expected.	Loss of approximately 1.1 acres of recreational land, 0.4 acres along the east bank, and 0.7 acres along the west bank. Reduced use and access during construction of new bridge.	No impacts expected. Use of existing bridge for bicycle/pedestrian traffic could increase access and use of COE recreational areas. Impacts would be similar to those presented for New Construction with New Ownership.

<p>Table 5.1-15 Summary of Environmental Impacts: Missouri River Bridge</p>						
Alternative	Rehabilitation of Existing Bridge		New Construction/ New Ownership		New Construction/ Removal	
Length	2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
WATER RESOURCES						
Surface Water	Potential erosion, sedimentation, and changes in water quality due to reinforcement activities. Reduced usage and restricted use of area for boaters, parks, and recreation area users in proximity to existing bridge. Potential contamination in the event of an accidental spill.	Potential contamination in the event of an accidental spill or derailment.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge, except restricted use would be extended upstream to include new construction area.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for New Construction with New Ownership, except the duration of restricted use would be extended for removal of existing bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.
Wetlands	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
Groundwater	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.	No impacts expected.
AIR QUALITY						
Air Quality	Temporary increase of fugitive dust, emissions from construction equipment, and delayed vehicles.	Increased train traffic on bridge would increase emissions.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Alternative	Rehabilitation of Existing Bridge	New Construction/ New Ownership		New Construction/ Removal
Length	2,056 feet of reconstruction and reinforcement of existing structures.	2,056 feet of new construction, retention of existing bridge for new use.	2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation
NOISE AND VIBRATION				
Noise	6 residences located within 500 feet. Increased noise from construction activities.	Increased frequency of noise due to increase in frequency of rail traffic.	10 residences located within 500 feet. Increased noise from construction activities.	10 residences located within 500 feet. Increased noise from construction activities. Increased period of disturbance due to removal activities after new bridge completion.
Vibration	Minor vibrations may be experienced during construction activities.	Potential structural damage to one residence between 0-100 feet; Inconvenience to 2 residences between 101-200 feet; and 2 residences between 201-400 feet.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Table 5.1-15 Summary of Environmental Impacts: Missouri River Bridge						
Alternative	Rehabilitation of Existing Bridge		New Construction/ New Ownership		New Construction/ Removal	
Length	2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
BIOLOGICAL RESOURCES						
Vegetation	Minimal removal of trees and grass along bridge structures to allow for reinforcement activities.	Noxious weeds may become established in disturbed areas. Use of herbicides could damage adjacent vegetation. Maintenance activities required to prevent overgrowth of trees under and around bridge.	Clearing of grass and trees along new rail and bridge alignment. Possible disturbance in adjacent areas.	Noxious weeds may become established in disturbed areas. Use of herbicides could damage adjacent vegetation. Maintenance activities required to prevent overgrowth of trees under and around bridge.	Impacts would be similar to those presented for New Construction with New Ownership.	Impacts would be similar to those presented for New Construction with New Ownership, except reestablishment of vegetation in area of bridge removal.
Non-Game Species						
Amphibians and Reptiles	Loss of habitat, displacement, and mortality due to falling debris and movement of machinery.	No impacts expected.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	No impacts expected.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	No impacts expected.

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Alternative	Rehabilitation of Existing Bridge		New Construction/ New Ownership		New Construction/ Removal	
Length	2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
Fisheries	Reduced habitat, food resource availability, and water quality degradation due to minimal increases in sediment and erosion. New cover due to lost bridge material. Contamination in the event of an accidental discharge of toxic materials in close proximity to waterway or from bridge.	Contamination of waterways could occur in the unlikely event of an accidental spill or derailment along bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge, except in-stream construction of piers and erosion along stream banks would increase potential for disturbance to bottom sediments and potential for loss of habitat due to sedimentation.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for New Construction with New Ownership, except duration of potential impacts would be extended until completion of removal activities following completion of new bridge construction.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.
Sensitive, Threatened, and Endangered Species						

Table 5.1-15

**Summary of Environmental Impacts:
Missouri River Bridge**

Alternative	Rehabilitation of Existing Bridge	New Construction/ New Ownership		New Construction/ Removal
Length	2,056 feet of reconstruction and reinforcement of existing structures.	2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.
Action	Construction	Operation	Construction	Operation
Pallid Sturgeon	Minimal increased TSS, reduced water quality, reduction or loss of food resources and habitat due to sedimentation caused by reinforcement of existing piers.	No impacts expected.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge, except in-stream construction of piers and erosion along stream banks would increase potential disturbance to bottom sediments and potential for loss of habitat due to sedimentation.	No impacts expected.
TRANSPORTATION				
Transportation	Increased traffic, reduced access, and congestion on local roadways. Accelerated wear and tear on local roadways.	Safe movement of heavier trains at higher speeds.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for New Construction with New Ownership.
			Increased rail line traffic with increased train speeds due to reduction in bridge approach curvature. Improved service and reliability. Use of existing bridge for bicycle/pedestrian traffic from adjacent trails.	Impacts would be similar to those presented for New Construction with New Ownership.

Table 5.1-15 Summary of Environmental Impacts: Missouri River Bridge						
Alternative	Rehabilitation of Existing Bridge		New Construction/ New Ownership		New Construction/ Removal	
Length	2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action	Construction	Operation	Construction	Operation	Construction	Operation
SAFETY						
Safety	Hazards to boaters and trail users due to in-stream rehabilitation activities and falling debris.	Safer rail transport of goods across the Missouri River. Reduced risk of derailment or accident.	Hazards to boaters and trail users due to in-stream construction activities and falling debris.	Increased hazard for water activities due to additional obstacles present in-stream. Safer rail transport of goods across the Missouri River. Reduced risk of derailment or accident.	Impacts would be similar to those presented for New Construction with New Ownership.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.
CULTURAL RESOURCES						
Cultural Resources	Listing of DM&E bridge on NRHP could be affected in the event of extensive modifications to the nature and character of the bridge.	No impacts expected.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	No impacts expected.	Loss of historic DM&E bridge due to removal following new bridge construction. Removal of any historic structure would require preparation of Section 303 statements in accordance with DOT Act of 1966.	No impacts expected.

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Table 5.1-15 Summary of Environmental Impacts: Missouri River Bridge							
Alternative		Rehabilitation of Existing Bridge		New Construction/ New Ownership		New Construction/ Removal	
Length		2,056 feet of reconstruction and reinforcement of existing structures.		2,056 feet of new construction, retention of existing bridge for new use.		2,056 feet of new construction, removal of 2,056-foot existing bridge.	
Action		Construction		Operation		Construction	Operation
RECREATION							
Recreation		Reduced access to boaters on the river. Closure of trails. Disturbance of participants of recreational activities and due to noise and human presence. Reduced attractiveness of the area due to alteration of visual setting.	Noise disturbance. Reduced usage of areas in proximity to rail line.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge. Removal of any public recreation land would require preparation of Section 303 statements in accordance with DOT Act of 1966.	Increased frequency of noise due to rail line traffic. Additional access for bicycle/pedestrian traffic across Missouri River using remodeled existing bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.
AESTHETICS							
Viewsheds/Scenic Values		Disruption due to ground disturbance, clearing of vegetation, and the presence of large machinery.	No impacts expected.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge, except the area of disturbance would be more extensive.	No impacts expected.	Impacts would be similar to those presented for New Construction with New Ownership.	No impacts expected.

Table 5.1-15
Summary of Environmental Impacts:
Missouri River Bridge

Alternative	Rehabilitation of Existing Bridge	New Construction/ New Ownership	New Construction/ Removal
Length	2,056 feet of reconstruction and reinforcement of existing structures.	2,056 feet of new construction, retention of existing bridge for new use.	2,056 feet of new construction, removal of 2,056-foot existing bridge.
Action	Construction	Construction	Construction
Nightlights	No impacts expected.	No impacts expected.	No impacts expected.
	Lighting along bridge may cause some disturbance of residents	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.	Impacts would be similar to those presented for Rehabilitation of Existing Bridge.

Table 5.3-1 Summary of Environmental Impacts From Minnesota Projects														
	M-2 ¹	M-3 ²	R-23	R-34	O-35	O-46	O-57	Rail Yards	DM&E Rebuild	Road projects	Airport Project	Highway construction	Quarry	Cumulative effect
GEOLOGY & SOILS	MTA	MTA	MLA	SLA	MLA	MLA	MLA	MLA	MTA	N	MLA	MLA	SLA	MLA
LAND USE														
Agriculture	MLA	MLA	MLP	MLP	MLA	MLA	MLA	SLA	MTA	N	MLA	MLA	SLA	MLA
Residential	STA	MLA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	N	N	MLA	MLA	MLA
Business	STA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	N	N	N	MLA
Public	SLA	SLA	MLA	N	N	N	N	MLA	MLA	MLA	N	N	MLP	MLA
WATER RESOURCES														
Surface water & Wetlands	SLA	MLA	MLA	SLA	MTA	MTA	MTA	SLA	MTA	N	MLA	MLA	MLA	MLA
Ground Water	N	N	MLA	SLA	N	N	N	MLA	N	N	N	N	MLA	MLA
AIR QUALITY	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	MLA	MLA	MTA	MLA
NOISE & VIBRATION	MLA	SLA	SLA	MLA	SLA	SLA	SLA	MLA	SLA	MTA	MLA	MLA	STA	SLA

¹ Alternative M-2 is the construction of a 13.3-mile new rail line bypass around the south side of Mankato, Minnesota.

² Alternative M-3 is the reconstruction of 10.1 miles of existing rail line and construction of 5.5 miles of new rail line within existing Union Pacific right-of-way through Mankato, Minnesota.

³ Alternative R-2 is the reconstruction of 23.3 miles of existing DM&E rail line through Rochester, Minnesota.

⁴ Alternative R-3 is the construction of a 34.1 mile bypass south of Rochester, Minnesota.

⁵ Alternative O-3 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 2.9 mile I&M connecting rail line.

⁶ Alternative O-4 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 1.7 mile I&M connecting rail line.

⁷ Alternative O-5 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the reconstruction of an existing I&M connection within existing rail line right-of-way.

Table 5.3-1 Summary of Environmental Impacts From Minnesota Projects														
	M-2 ¹	M-3 ²	R-23	R-34	O-35	O-46	O-57	Rail Yards	DM&E Rebuild	Road projects	Airport Project	Highway construction	Quarry	Cumulative effect
BIOLOGICAL RESOURCES														
Vegetation	MTA	MTA	MTA	MTA	MTA	MTA	MTA	SLA	SLA	N	MLA	MLA	MLA	MLA
Wildlife	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MLA	N	MLA	MLA	MLA	MLA
Fisheries	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MTA	MTA	N	N	MTA	N	MTA
Threatened & Endangered	N	N	N	N	N	N	N	N	MLA	N	N	N	N	MLA
TRANSPORTATION	MTA	MTA	MLA	MLA	MTA	MTA	MTA	MLA	MLA	MLP	MLP	SLP	N	MLA
SAFETY	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	SLA	MLP	N	MLP	MLA	MLA
HAZARDOUS MATERIALS	N	N	N	N	N	N	N	N	N	N	N	N	N	N
ENERGY RESOURCES	N	N	MLP	MLA	MLP	MLP	MLP	MLP	MLP	N	N	N	N	MLP

¹ Alternative M-2 is the construction of a 13.3-mile new rail line bypass around the south side of Mankato, Minnesota.

² Alternative M-3 is the reconstruction of 10.1 miles of existing rail line and construction of 5.5 miles of new rail line within existing Union Pacific right-of-way through Mankato, Minnesota.

³ Alternative R-2 is the reconstruction of 23.3 miles of existing DM&E rail line through Rochester, Minnesota.

⁴ Alternative R-3 is the construction of a 34.1 mile bypass south of Rochester, Minnesota.

⁵ Alternative O-3 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 2.9 mile I&M connecting rail line.

⁶ Alternative O-4 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 1.7 mile I&M connecting rail line.

⁷ Alternative O-5 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the reconstruction of an existing I&M connection within existing rail line right-of-way.

Table 5.3-1 Summary of Environmental Impacts From Minnesota Projects														
	M-2 ¹	M-3 ²	R-23	R-34	O-35	O-46	O-57	Rail Yards	DM&E Rebuild	Road projects	Airport Project	Highway construction	Quarry	Cumulative effect
CULTURAL RESOURCES	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	SLA	N	N	N	N	MLA
SOCIO-ECONOMIC	SLP	SLP	SLP	SLP	SLP	SLP	SLP	SLP	SLP	N	MLP	MLP	MLP	SLP
RECREATION	SLA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	N	N	MLP	N	MLA
AESTHETICS	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA	MLP	N	MLA	MLA	MLA

Legend:

S- Significant impact expected

M- Minor impact expected

L-Long-term impact expected

T- Temporary impact (during construction)

A- Adverse impact

P- Positive

N-No impact expected

¹ Alternative M-2 is the construction of a 13.3-mile new rail line bypass around the south side of Mankato, Minnesota.

² Alternative M-3 is the reconstruction of 10.1 miles of existing rail line and construction of 5.5 miles of new rail line within existing Union Pacific right-of-way through Mankato, Minnesota.

³ Alternative R-2 is the reconstruction of 23.3 miles of existing DM&E rail line through Rochester, Minnesota.

⁴ Alternative R-3 is the construction of a 34.1 mile bypass south of Rochester, Minnesota.

⁵ Alternative O-3 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 2.9 mile I&M connecting rail line.

⁶ Alternative O-4 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the construction of a 1.7 mile I&M connecting rail line.

⁷ Alternative O-5 is the reconstruction of 9.5 miles of existing DM&E rail line through Owatonna, Minnesota and the reconstruction of an existing I&M connection within existing rail line right-of-way.

Table 5.3-2
Summary of Environmental Impacts From Eastern South Dakota Projects

	B-2 (Brookings Existing Rail line)	B-3 (Brookings Bypass)	B-4 (Brookings Bypass)	Rail Yards	DM&E Rebuild	Railroad Spur Extension	Missouri River Bridge	Cumulative effect
GEOLOGY & SOILS	MLA	MLA	MLA	MLA	MLA	N	MTA	MLA
LAND USE								
Agriculture	MLA	MLA	MLA	MTA	MLA	N	N	MLA
Residential	SLA	MLA	MLA	MLA	MLA	N	MTA	MLA
Business	SLA	MLA	MLA	MLA	MLA	MLP	N	MLA
Public Lands	N	MLA	MLA	MTA	MLA	N	MTA	MLA
WATER RESOURCES								
Surface water & Wetlands	MLA	MLA	MLA	SLA	MLA	N	MTA	STA
Ground Water	N	N	N	MTA	MTA	N	N	MTA
AIR QUALITY	MLA	MLA	MLA	MLA	MLA	MTA	MTA	MLA
NOISE & VIBRATION	SLA	MLA	MLA	MLA	MLA	MTA	MTA	MLA
BIOLOGICAL RESOURCES								
Vegetation	MTA	MLA	MLA	SLA	MTA	MTA	MLA	MLA
Wildlife	MTA	MTA	MTA	MTA	MTA	N	MTA	MTA
Fisheries	MTA	MTA	MTA	MTA	MTA	N	MTA	MTA
Threatened & Endangered	N	N	N	N	MTA	N	MTA	MTA
TRANSPORTATION	STA	MLA	MLA	MLA	MTA	N	MTA	MTA
SAFETY	MLA	MLA	SLA	MLA	SLA	N	MLA	SLA
HAZARDOUS MATERIALS	N	N	N	N	N	N	N	N
ENERGY RESOURCES	MLP	MLP	MLP	MLP	MLP	N	N	MLP
CULTURAL RESOURCES	N	N	N	N	MTP	N	MTP	MTP
SOCIO-ECONOMIC	STP	STP	STP	SLP	SLP	SLP	N	SLP
RECREATION	MTA	MTA	MTA	N	MLA	N	MTA	MLA
AESTHETICS	MLA	MLA	MLA	MLA	MLA	N	MLA	MLA

Table 5.3-3 Summary of Environmental Impacts From Western South Dakota/Wyoming New Construction Projects											
	Extension Alternative B	Extension Alternative C	Extension Alternative D	Spring Creek/ Hay Canyon Alternatives	Rail Yards	Mine Loop Alternatives	Coal Bed Methane	Two Elk Electric Plant	Increased Coal Production	Additional Rail line	Cumulative effect
GEOLOGY & SOILS	SLA	SLA	SLA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	MLA
LAND USE											
Agriculture	SLA	SLA	SLA	MLA	MLA	MLA	MLA	MLA	MLA	N	SLA
Residential	MLA	MLA	SLA	N	MLA	N	N	MLA	N	N	MLA
Business	N	N	SLA	N	MLA	N	N	MLA	MLA	N	MLA
Public	SLA	SLA	SLA	N/SLA	MLA	MLA	MLA	N	MLA	N	SLA
WATER RESOURCES											
Surface water & Wetlands	SLA	SLA	SLA	SLA	MLA	MLA	SLA	N	MLA	MTA	SLA
Ground Water	MLA	MLA	MLA	N	N	N	SLA	N	MLA	N	MLA
AIR QUALITY	SLA	SLA	SLA	MLA	MLA	MTA	MLA	MLA	MLA	MLA	MLA
NOISE & VIBRATION	MLA	MLA	SLA	MLA	MLA	MTA	SLA	N	MLA	MLA	MLA

Table 5.3-3 Summary of Environmental Impacts From Western South Dakota/Wyoming New Construction Projects											
	Extension Alternative B	Extension Alternative C	Extension Alternative D	Spring Creek/ Hay Canyon Alternatives	Rail Yards	Mine Loop Alternatives	Coal Bed Methane	Two Elk Electric Plant	Increased Coal Production	Additional Rail line	Cumulative effect
BIOLOGICAL RESOURCES											
Vegetation	SLA	SLA	MLA	SLA	SLA	MLA	MLA	MLA	MLA	N	MLA
Wildlife	MLA	MLA	MLA	MLA	MSA	MTA	MTA	MTA	MTA	N	MLA
Fisheries	MLA	MLA	MLA	MLA	MSA	MTA	MLA	N	MLA	MTA	MLA
Threatened & Endangered	SLA	MLA	MLA	MLA	MTA	MTA	N	N	N	N	MLA
TRANSPORTATION	MLA	MLA	MLA	MLA	MLA	MLA	MTA	MLA	MLA	MLA	MLA
SAFETY	SLA	MLA	SLA	MLA	STA	MLA	MTA	MLA	MLA	MLA	MLA
HAZARDOUS MATERIALS	N	N	N	N	N	N	N	N	N	N	N
ENERGY RESOURCES	MLP	MLP	MLP	MLP	MLP	MLP	MLP	MLP	MLP	MLP	MLP
CULTURAL RESOURCES	SLA	SLA	SLA	SLA	N	N	N	N	N	N	SLA
SOCIO-ECONOMIC	STP	STP	STP	N	SLP	N	MLA	SLP	SLP	MLA	STP
RECREATION	MLA	MLA	MLA	MLA	N	MLA	N	N	N	N	MLA
AESTHETICS	MLA	MLA	MLA	MLA	N	MLA	MLA	MLA	MLA	N	MLA

CHAPTER 6

CONCLUSIONS

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**CHAPTER 6
CONCLUSIONS**

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CHAPTER 6 CONCLUSIONS

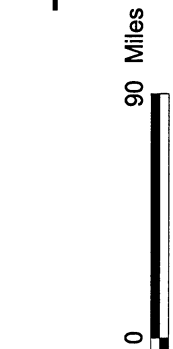
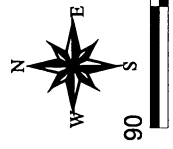
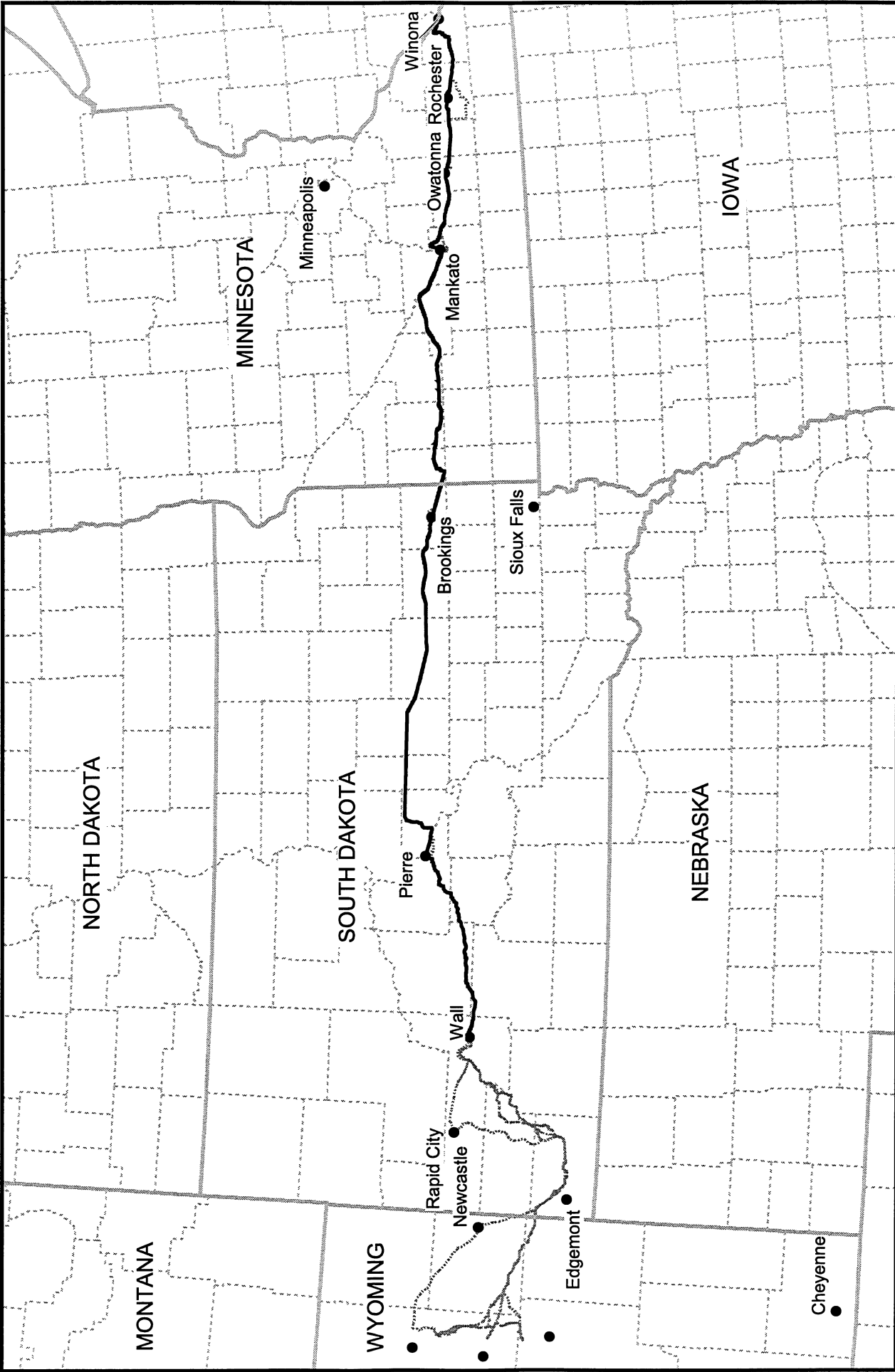
6.0 OVERVIEW

The Dakota, Minnesota & Eastern Railroad Corporation's (DM&E's) proposal to construct new rail facilities into Wyoming's Powder River Basin is a complex project. It is the largest and most challenging construction proposal ever before the Board. It involves approximately 1,000 miles of rail line, traverses three states, necessitates the participation of five cooperating agencies and entails numerous and diverse environmental issues, as well as several alternatives and bypass proposals. The proposal itself, first described by DM&E in its February 20, 1998 Application to the Surface Transportation Board, involves several parts, including the proposed new rail line extension mentioned above, rebuilding DM&E's existing rail line and constructing new rail yards and sidings between Winona, Minnesota, and Wall, South Dakota, and rail line constructions in Mankato, Minnesota, and Owatonna, Minnesota (Figure 6-1).

In addition to DM&E's original proposal, several alternatives were developed during public scoping. Four alternatives for the new rail construction into the Powder River Basin, or PRB, have been analyzed in this document: Alternative A (No-Action); Alternative B (DM&E's Proposed Action); Alternative C (the Modified Proposed Action); and Alternative D (Existing Transportation Corridors). A complete description of each of these alternatives and the process by which these additional alternatives were developed is set forth in detail in Chapter 2.

As a result of SEA's additional consultation, particularly with other Federal and state agencies and members of the public, two additional variations to Alternative C have been developed by DM&E. Alternative alignment options into two of the mines in the Powder River Basin have also been developed by DM&E. Finally, bypass proposals have been submitted by four communities through which the existing DM&E rail line currently passes: Rochester, Minnesota; Owatonna, Minnesota;¹ Brookings, South Dakota; and Pierre, South Dakota.

¹ By letter dated March 13, 2000 from Owatonna Mayor Peter Connor, the City of Owatonna withdrew its bypass proposal from consideration. See Letter attached at Appendix B.



Existing Rail Line New Construction Alternatives
County Lines

Figure 6-1
POWDER RIVER BASIN EXPANSION PROJECT
Project Overview

This chapter presents a summary of the various alternatives under consideration in this Draft EIS. It highlights the potential environmental impacts that would result from each alternative. Finally, it sets forth SEA's preliminary conclusions or determinations on alternatives,² based on its analysis, all information available to date, and site visits. Again, SEA emphasizes that these conclusions, as with all analysis in this Draft EIS, are preliminary. SEA welcomes public comment on all aspects of this Draft EIS, including the preliminary conclusions set forth below.

6.1 DM&E PROPOSAL AND ALTERNATIVES CONSIDERED IN THIS DRAFT EIS

The original project as described by DM&E in its February, 1998 Application included the following components:

- Construction and operation of a new rail line extending DM&E's existing system westward, accessing mines in the Powder River Basin of Wyoming for the transport of the region's coal resources to coal users located east of the basin (designated in this Draft EIS as Alternative B).
- Reconstruction and continued operation of DM&E's existing rail line across South Dakota and Minnesota to standards allowing DM&E to safely and efficiently transport up to 100 million tons of coal annually in unit coal trains, as well as its existing rail traffic.
- Construction and operation of new rail line to connect two sections of DM&E's existing rail line at Mankato, Minnesota and avoid operating over existing rail lines owned and operated by Union Pacific Railroad Company (UP) via trackage rights (designated in this Draft EIS as the M Alternatives).

² As explained earlier in this Draft EIS, the Surface Transportation Board is the lead agency, pursuant to 40 CFR 1501.5(c), supervising preparation of the EIS. The Board is working with five cooperating agencies in this endeavor: the USDA Forest Service (USFS); the USDI Bureau of Land Management (BLM); the U.S. Army Corps of Engineers (COE); the USDI Bureau of Reclamation (Reclamation); and the U.S. Coast Guard. The Board and five cooperating agencies will each issue decisions in their areas of jurisdiction and expertise based on this EIS. The conclusions set forth in this chapter generally are those of the Board's Section of Environmental Analysis (SEA), which is responsible for ensuring the Board meets its responsibilities under the National Environmental Policy Act (NEPA). Where one of the cooperating agencies has identified an environmentally preferable alternative, it is so noted. One of the cooperating agencies, the COE, does not select an environmentally preferable alternative, but rather, through the 404 permit process of the Clean Water Act, identifies the feasible alternative that would be least environmentally damaging.

- Construction and operation of a new rail line connection between DM&E's existing rail line and the existing rail line of I&M Rail Link (I&M) at Owatonna, Minnesota (designated in this Draft EIS as the O Alternatives).

Action Alternatives developed as a result of the public scoping process³ included:

- Construction and operation of an alternative route for extending DM&E's existing rail system that would minimize use of the Cheyenne River corridor, loss of wetlands, and impacts to riparian habitats and avoid USFS RARE II (Roadless Area Review and Evaluation) areas in South Dakota, and avoid potential endangered species habitat in Wyoming (designated in this Draft EIS as Alternative C).
- Construction and operation of an alternative that would, to the extent practical and feasible, utilize existing transportation corridors in the vicinity of the project area, particularly existing rail lines (designated in this Draft EIS as Alternative D).
- Construction and operation of alternative routes for the proposed rail line extension in the Spring Creek area of South Dakota to avoid wetland and riparian habitats along Spring Creek (designated in this Draft EIS as the Spring Creek Alternatives).
- Construction and operation of alternative routes for proposed rail line extension in the Hay Canyon area of South Dakota to avoid wetland and riparian habitats along Hay Canyon and lands irrigated as part of the Angostura Irrigation Project (designated in this Draft EIS as the Hay Canyon Alternatives).
- Construction and operation of alternative routes for accessing the Black Thunder coal mine in Wyoming (designated in this Draft EIS as the Black Thunder Mine Loop Alternatives).

³ Scoping is a process under NEPA that is part of the preparation of a draft environmental impact statement where Federal, state, and local agencies, Tribes, affected landowners, and other interested parties have the opportunity to provide information to the agency(s) preparing the environmental impacts statement identifying important resources, issues, or concerns that may be affected by the project. Public meetings and submission of written comments by interested agencies, Tribes, and the public are means used to obtain information on the project area. Scoping involves wide-distribution of information and requests for comments. Based on the information obtained, the agency(s) develop a Scope of Study outlining the resources and analyses to be completed as part of preparing the environmental impact statement.

- Construction and operation of alternative routes for accessing the North Antelope coal mine in Wyoming (designated in this Draft EIS as the North Antelope Mine Loop Alternatives).
- Construction and operation of a new rail line alternative route that would bypass the existing DM&E rail line through the City of Rochester, Minnesota, as proposed by Rochester (designated in this Draft EIS as the R Alternatives).
- Construction and operation of a new rail line alternative route that would bypass the existing DM&E rail line through the town of Owatonna, Minnesota, as proposed by Owatonna.
- Construction and operation of a new rail line alternative route that would bypass the existing DM&E rail line through the town of Brookings, South Dakota, as proposed by Brookings (designated in this Draft EIS as the B Alternatives).
- Construction and operation of a new rail line alternative route that would bypass the existing DM&E rail line through the town of Pierre, South Dakota, as proposed by Pierre.
- Construction and operation of six major new rail yards, many new rail sidings, and improvements to several existing rail yards.
- The No-Action Alternative, under which DM&E could not build its proposed new rail line into the PRB, or its proposed 13.31-mile rail line in Mankato, Minnesota, or its proposed 2.94-mile rail line in Owatonna, Minnesota (designated in this Draft EIS as the No-Action Alternative).

As discussed in Chapter 2 in this Draft EIS, SEA has analyzed each of these alignments to determine if they presented reasonable and feasible alternatives for the project or if they would simply shift environmental impacts from one area to another. As a result of its analysis, SEA has determined that the alternative to bypass the town of Pierre is not reasonable and feasible; therefore, SEA has excluded this project component from further consideration and environmental analysis in this document. For the complete discussion of the Pierre Bypass and the reasons for SEA's conclusion, see Chapter 2. Additionally, the town of Owatonna withdrew its proposal for consideration of a bypass around the community (see Letter dated March 13, 2000 from Owatonna Mayor Peter Connor at Appendix B). Therefore, SEA is not considering the Owatonna Bypass proposal. All other project components have been retained for environmental analysis. Potential environmental impacts have been assessed and an analysis of whether the

alternative would be reasonable and feasible have been undertaken and set forth earlier in this document. All alternatives considered are described in detail in Chapter 2 of this Draft EIS. The results of SEA's analysis for each of the alternatives' potential impacts are discussed in Chapter 3 (Minnesota components) and Chapter 4 (South Dakota and Wyoming components).

6.2 PRELIMINARY SELECTION OF PREFERRED ALTERNATIVES

In this Draft EIS, SEA has analyzed each of the reasonable and feasible alternatives for the various components of the project to determine the potential environmental impacts that would result from each alternative. Because each of the project components are independent of the other components — that is, selection of one alternative for a particular project component does not foreclose or require selection of a specific alternative for another project component — SEA has conducted a separate evaluation for each project component to determine whether an alternative would be reasonable and feasible and which alternative would be preferred for the specific project component. For example, Alternative D for the rail line extension would generally use existing DM&E right-of-way south from Rapid City to Smithwick, South Dakota. It would cross Spring Creek once along this alignment, but would be located over 20 miles west of the Cheyenne River and the alignments of Alternatives B and C. Although it would cross Spring Creek, Alternative D would completely avoid the Spring Creek area through which Extension Alternatives B and C would be required to pass due to these alternatives following new alignment along the Cheyenne River. Therefore, Alternative D would not require use, nor construction or operation, of any of the Spring Creek Alternatives because Alternative D avoids the area of Spring Creek area.

Additionally, it is important to keep in mind that because each project component is independent of the other components, the decision-maker could chose to approve some components of the project and not others. It is possible, for example, for one of the build routes into the Powder River Basin to be approved, but none or only some of the community bypasses.

The following sections discuss SEA's alternative comparisons and its rationale for selection of its preferred alternatives. As the forthcoming chapter reveals, SEA has not indicated a preference for every project component. In some instances, the degree of potential environmental impact of the various alternatives appears to be very close. In these circumstances, SEA believes that it would benefit from public review and comment on the analysis contained in this Draft EIS before ultimately making a recommendation to the Board. SEA encourages public comment on all the alternative routings it has considered, particularly those for which SEA has deferred identification of an environmentally preferable alternative, including the No-Action Alternative. Table 6-1 provides a brief summary of SEA's alternatives analyses and preliminary conclusions.

Table 6-1

**Summary Highlights of Environmental Impacts
South Dakota and Wyoming New Construction**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Alternative B	Proposed route, extends southwest from Wall, South Dakota along the Cheyenne River and westward into Wyoming to access the coal mines	Extend DM&E's existing system westward to access the coal mines in the Powder River Basin of Wyoming	Unique Geological Formations, Soils, Paleontological Resources, Agriculture, Land Use (Residential, Federal Lands), Minerals and Mining, Surface Water, Wetlands, Groundwater, Air Quality, Noise, Vibration, Vegetation, Wildlife, Threatened and Endangered Species, Transportation, Safety, Energy Resources, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	Should it be determined that the project must meet the propose and need identified for the project Alternative C appears to be the least environmentally intrusive alternative.
Alternative C	Modified proposed route similar to Alternative B but with the alignment modification to avoid the environmentally sensitive areas along the Cheyenne River	Extend DM&E's existing system westward to access coal mines in the Powder River Basin of Wyoming and avoid environmentally sensitive areas along the Cheyenne River	Unique Geological Formations, Geological Hazards, Soils, Paleontological Resources, Agriculture, Land Use (Residential, Federal Lands), Minerals and Mining, Surface Water, Wetlands, Groundwater, Air Quality, Noise, Vibration, Vegetation, Wildlife, Threatened and Endangered Species, Transportation, Safety, Energy Resources, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	

Table 6-1

**Summary Highlights of Environmental Impacts
South Dakota and Wyoming New Construction**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Alternative D	Existing corridor alternative that utilizes existing rail line from Wall to Rapid City to Smithwick, new alignment west to Edgemont and then parallel existing rail line to access the mines	Extend DM&E's existing system westward to access coal mines in the Powder River Basin of Wyoming while utilizing existing rail lines to the extent practicable	Geological Hazards, Soils, Paleontological Resources, Agriculture, Land Use (Residential, Business and Industrial, Federal Lands), Minerals and Mining, Surface Water, Wetlands, Groundwater, Air Quality, Noise, Vibration, Vegetation, Wildlife, Threatened and Endangered Species, Transportation, Safety, Energy Resources, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	

6.2.1 Rail Line Extension Alternatives into the Powder River Basin: Alternatives B, C, and D

6.2.1.1 Overview

DM&E identified two purposes for its proposed project in its Application to the Board: first, to construct and operate a rail line providing a third, competitive and efficient rail carrier access to eleven coal mines in the Powder River Basin; and to reconstruct its existing rail infrastructure. DM&E indicates that this project is needed to provide the revenue base to allow it to upgrade its existing rail line to competitive and current industry standards to provide safe and reliable rail service to its existing shippers. Absent this revenue base, DM&E states that it would be unable to finance the system-wide rehabilitations required on its system (See also the Board December 10, 1998 decision in Appendix A, stating (at page 45) that without these system-wide improvements, DM&E could “cease to exist as a viable railroad” and would no longer be able to serve its existing shippers).

Second, DM&E proposes this project to take advantage of the need for low-sulfur coal, which many utilities are using to obtain emissions levels required under the Clean Air Act Amendments and the increasing demand for electrical energy, as well as the need for increased rail capacity and rail competition. Each of these aspects of DM&E’s purpose and need for this project are discussed in detail in Chapter 1.

6.2.1.2 The No-Action Alternative: Alternative A

Notwithstanding the Board’s conclusions regarding DM&E’s need to make system-wide improvements to assure its viability in the December 10, 1998 decision, SEA has considered whether the No-Action Alternative (which would result from project denial in the final decision the Board will issue following completion of this environmental review process) would be environmentally preferable to allowing the PRB Expansion Project to proceed. Under the No-Action Alternative, DM&E would not construct or operate a rail line extension into the PRB. The Board would not approve the Application to construct, operate, and maintain a rail line extension. The Special Use Application submitted by DM&E for an easement under the Federal Land Management And Policy Act (FLPMA) to cross portions of the Buffalo Gap National Grassland in South Dakota, and the Thunder Basin National Grassland in Wyoming would not be granted by the USFS. The Application for a right-of-way crossing portions of land administered by the BLM in South Dakota and Wyoming would not be issued. COE would not issue a permit for impacting waters and wetlands of the United States. Reclamation would not issue a permit for project impacts to lands and facilities that are part of the Angostura Irrigation Project. The Coast

Guard would not issue a permit for rehabilitation of the existing or construction of a new rail bridge over the Missouri River at Pierre, South Dakota.

As detailed in Chapter 4, construction and operation of the proposed new 280-mile rail line extension would have substantial adverse affects on a variety of natural and human resources. Construction of the proposed rail line would result in conversion of thousands of acres of land to rail line right-of-way, including hundreds of acres of public land, thereby removing it from current land uses. Many farms and ranches would be crossed, resulting in inconveniences and likely a need to significantly alter existing farming and ranching operations.

Construction would also clear and disturb these lands, removing vegetation and disturbing soils, reducing wildlife habitat and potentially affecting water quality. Significant paleontological and cultural resources could be destroyed from excavation and earthmoving activities.

During rail operations, farmers and ranchers would continue to be inconvenienced and farming and ranching operations affected. Noise from locomotives would disturb wildlife, livestock, and local residents. Air emissions from locomotives would create reduced visibility within Class I airsheds. Rail line crossings of roadways would delay traffic and provide opportunities for vehicle/train and train/pedestrian accidents. Chapter 4 discusses these potential impacts and Table 5.1-1 provides a summary of these potential impacts.

On the other hand, the No-Action Alternative (Alternative A) could also have substantial and significant adverse impacts to the human and natural environment. Unlike most cases, here the No-Action Alternative would not simply preserve the environmental status quo. Absent construction of a new rail line, which according to DM&E is necessary to give it the resources needed to rehabilitate its existing track, DM&E has indicated that it could not afford to upgrade the existing rail line. In that event, DM&E states it would likely continue to have a poor accident record, potentially compromising the safety of not only merchandise and equipment, but railroad personnel and the public as well. DM&E notes that, without the construction of new rail line and the related rebuild of the existing rail line, trains along the existing rail line would continue to operate at low speeds, resulting in frequent significant delays at road crossings. DM&E's existing shippers would be required to ship goods in conditions below accepted industry standards because they would be incapable of utilizing standard weighted cars, reducing the shippers' ability to be competitive. The safety of existing road crossings would continue to decline as crossing surfaces and the rail line deteriorate, increasing the potential for train and train/vehicle accidents. Roadway safety could also be reduced should shippers chose to rely more on trucks for their transportation needs, diverting rail shipments to less efficient truck transportation, putting an increased number of trucks on local roadways. Should DM&E become a non-viable rail line, as noted by the Board in its December 10, 1998 decision, rail service could be lost to most of South

Dakota and southern Minnesota, potentially resulting in significant economic hardship for the agricultural communities throughout the region, as well as increased truck traffic on local roads due to rail traffic no longer being available to ship goods. In sum, the No-Action Alternative would pose safety impacts, both rail and highway, and economic impacts to rail shippers along the existing rail line as well as potentially to the regional agricultural economy.

Moreover, the No-Action Alternative would not satisfy the purpose or need defined for the project. The No-Action Alternative would not provide DM&E the financial resources needed to reconstruct its existing system, nor would it enable DM&E to provide safe, reliable, and efficient rail service to its existing and new shippers. Under the No-Action Alternative, a third rail carrier would not obtain access to the Powder River Basin, and the potential benefits of DM&E's proposal — increased competition for coal shippers, increased regional rail capacity, and an additional rail option for utilities to utilize in obtaining Powder River Basin coal to meet the requirements of the Clean Air Act and increasing demand for electrical energy — would not occur.

Finally, under any of the Action Alternatives, mitigation measures could be imposed to minimize, reduce, or eliminate some of the potential environmental impacts. SEA recognizes that some of the environmental impacts of the Action Alternatives may not be mitigatable, or it may not be possible to mitigate the impacts to insignificant levels. However, under the No-Action Alternative, the Board has no ability to impose mitigation because the Board would not grant DM&E's Application to construct a new rail line.⁴

In most rail construction cases, the No-Action, or No-Build, Alternative typically means retaining the status quo. However, in this case, there is the real possibility that the No-Action Alternative (Alternative A) could itself have significant impacts on safety and the agricultural economy of Minnesota and South Dakota. DM&E has said that if it does not obtain additional revenue, the existing system will continue to deteriorate. This deterioration would aggravate safety problems on the existing rail line. In short, the No-Action Alternative likely would result in significant adverse environmental impacts in view of the likely continued deterioration of DM&E's existing rail line, particularly in the area of safety. Nevertheless, SEA preliminarily concludes, based on the information available to date, that, although the No-Action Alternative has its own potentially significant environmental impacts and would not meet the Applicant's purpose and need, it would be premature to reject it at this point, given the substantial adverse environmental impacts associated with all the Action Alternatives and the difficulty of effectively mitigating some of their impacts. SEA requests further comments on the No-Action Alternative.

⁴ In that event, however, DM&E could still upgrade its existing system, should it find the financial resources to do so because rehabilitation of an existing rail line by itself does not require Board approval of environmental review.

SEA will consider the comments and, if appropriate, determine if the No-Action Alternative would be the environmentally preferable alternative in the Final EIS.

6.2.1.3 The Action Alternatives: Alternatives B, C, and D

In assessing the Action Alternative, SEA has compared three routes for a new rail line extension — Alternatives B, C, and D — to each other, considering the potential environmental impacts, engineering constraints, and economic considerations associated with each route (Figure 6-2). As discussed in Chapter 2, DM&E included Alternative B in its Application as its “preferred alternative.” During the scoping process, SEA and the cooperating agencies identified a number of significant environmental issues and concerns with Alternative B. As a result of scoping meetings and extensive consultation with Federal and state agencies, DM&E modified various portions of Alternative B to avoid particularly environmentally-sensitive areas and minimize potential environmental impacts. Although DM&E has stated that Alternative C is less efficient and substantially more costly to construct and operate than Alternative B, DM&E proposed this modification to Alternative B as a feasible alternative for the project.

Also during the public scoping process, SEA and the cooperating agencies received numerous inquiries from the public suggesting that DM&E use existing transportation corridors, particularly rail, for the project rather than construction of new rail line in new right-of-way. SEA and the cooperating agencies conducted site visits, examined maps, and reviewed available information regarding the study area and agreed that there could be opportunities to use or parallel existing transportation corridors in this case. SEA and the cooperating agencies then consulted with DM&E to determine which, if any, of these corridors would provide reasonable and feasible alternatives for the project. After considerable investigation, DM&E concluded that it believed none of the proposed existing corridor alternatives would be feasible. SEA and the cooperating agencies, however, determined that an existing rail corridor alternative should, nevertheless, be evaluated in the Draft EIS. Therefore, an alternative alignment — Alternative D — that SEA and the cooperating agencies believed would make the most effective use of the existing rail corridor opportunities in the area, was developed and included as a project alternative.

In reviewing the alternatives, SEA recognizes that, with the exception of the environmentally sensitive areas described above, generally Alternatives B and C are similar. They follow roughly the same alignment, being located in a corridor making use of the Cheyenne River drainage. These alternatives also involve new rail line construction across similar topography and entirely new right-of-way. Conversely, Alternative D would involve reconstruction of existing rail line and construction of new rail line parallel to existing rail. Only a small portion, approximately 102.1 miles (approximately 29 percent) of the total 353.4 miles of Alternative D would involve

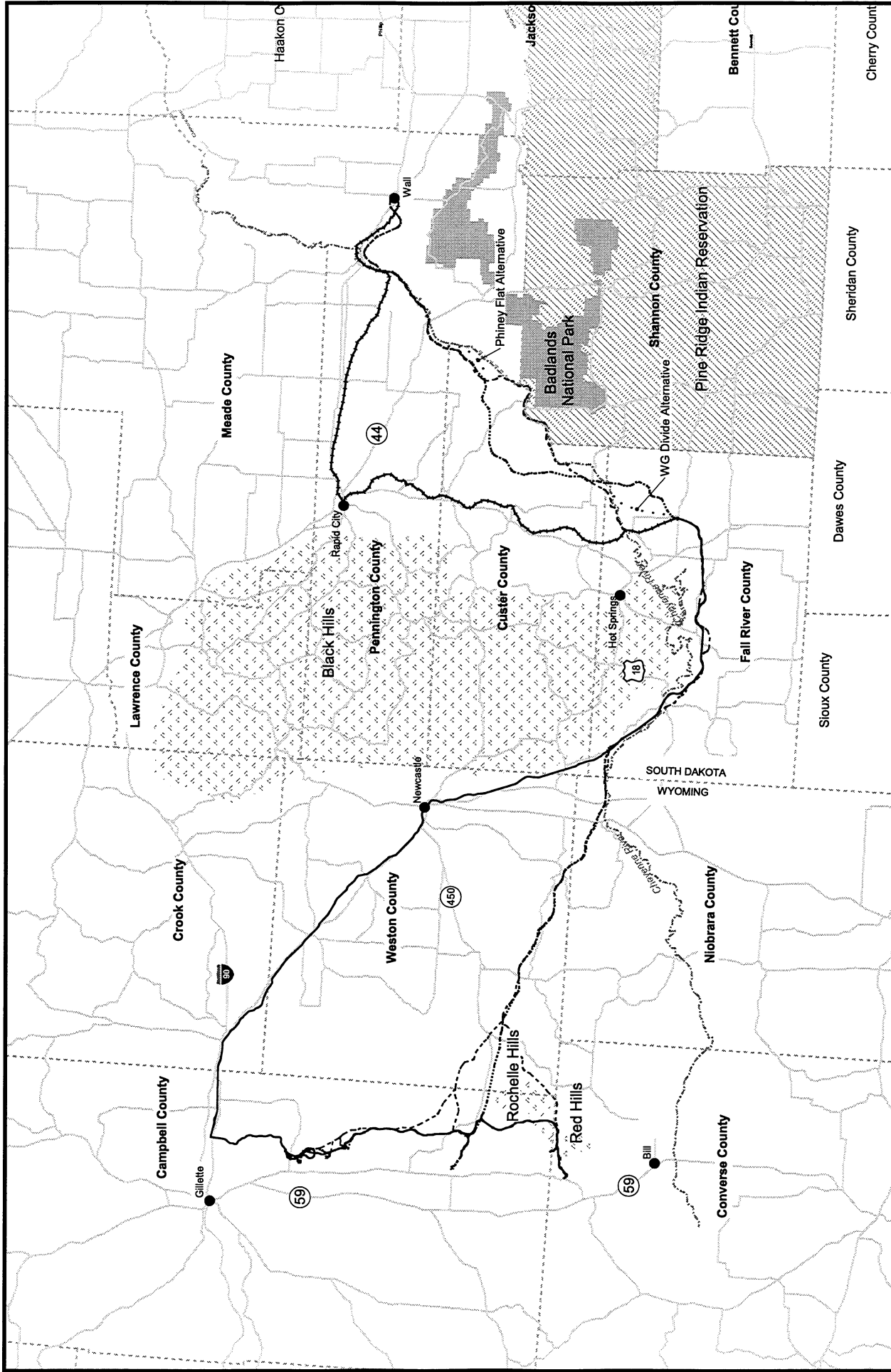


Figure 6-2
POWDER RIVER BASIN EXPANSION PROJECT
 Alternatives B, C, and D

rail line construction on new right-of-way (Table 2.2-1), less than half what would be required for Alternatives B (260.6 miles) and C (256.3 miles). SEA compared the environmental impacts potentially resulting from Alternative D with those of Alternatives B and C to determine if, in this case, construction of new rail line or utilization of existing rail corridors would provide a preferred project alternative.

In conducting its comparison of alternatives, SEA has determined that each of the Extension Alternatives would have significant environmental impacts. However, the nature, quantity, and resources impacted would vary between alternatives.

In addition to rail line construction, DM&E stated that it would also need to construct rail yards. As many of the yard locations and sizes were identical or similar for the various alternative rail line construction routes, few substantial differences in the environmental impacts of rail yards were observed. Therefore, while the impacts from construction and operation of the rail yards for each alternative contribute to the overall potential environmental impact of that alternative, because the impacts related to rail yards are generally similar, consideration of rail yard impacts did not provide SEA a means of differentiating alternatives routes based on anticipated impacts. Because the potential environmental impacts associated with the proposed of rail yards are essentially the same, in deciding which alternative should be identified as environmentally preferable, SEA has focused primarily on the potential environmental impacts resulting from new rail line construction in South Dakota and Wyoming.

In assessing the Action Alternatives, SEA first identified those resources expected to be significantly impacted by one or more of the proposed Extension Alternatives. SEA studied the following resource impact areas: safety, land use, geologic hazards, soils, paleontological resources, water resources, wetlands, air quality, noise, threatened and endangered species, cultural resources, socioeconomics,⁵ environmental justice, aesthetics, and cumulative effects. SEA assessed differences in the effects of each alternative upon each of these areas to determine the differences between the alternatives concerning their potential environmental impacts and which, if any, of the three Action Alternatives should be identified as environmentally preferable. SEA preliminarily concluded that each of these Extension Alternatives would have significant impacts to land use, soils, paleontological resources, water resources, wetlands, air quality,

⁵ The Board typically limits its socioeconomic analysis to the impacts directly related to the changes in the physical environment that would result from a proposed project. However, in this case, to meet the needs of the cooperating agencies, the Board has expanded its analysis to include an evaluation of the potential indirect impacts resulting to the socioeconomics of the project area as a result of the influx of construction workers and associated spending, new permanent railroad employees, and changes in the tax base for the various counties affected due to new and improved rail facilities.

cultural resources, socioeconomics, and aesthetics within the area their alignments are proposed for construction and operation. In addition, each Extension Alternative would result in rail traffic increases along DM&E's existing system that would have significant impacts to noise levels and safety. Similarly, in reviewing the impacts of Alternative D, SEA determined that Alternative D would have significant impacts on noise and vehicle traffic and safety. Table 6-2 sets forth a summary comparison of the environmental resources SEA determined to be significantly impacted as a result of Alternatives B, C, and D.

Table 6-2 Resources Along New Rail Alignment Significantly Impacted By Action Alternatives (New Rail Line Construction in Wyoming and Western South Dakota)			
Resource	Alternative		
	B	C	D
Safety	significant impact	no significant impact	highly significant impact
Land Use	significant impact - agricultural land Federal lands	significant impact - agricultural land Federal lands	significant impact - residential land business and industrial land
Geologic Hazards	significant impact	significant impact	no significant impact
Soils	significant impact	significant impact	significant impact
Paleontological Resources	significant impact	significant impact	significant impact
Water Resources	significant impact	significant impact	significant impact
Wetlands	significant impact	significant impact	significant impact
Air Quality	significant impact	significant impact	significant impact
Noise	no significant impact	no significant impact	significant impact
Transportation	no significant impact	no significant impact	substantial impact
Safety	significant impact	no significant impact	highly significant impact
Vegetation	significant impact	significant impact	no significant impact
Endangered Species	significant impact	no significant impact	no significant impact

Table 6-2 Resources Along New Rail Alignment Significantly Impacted By Action Alternatives (New Rail Line Construction in Wyoming and Western South Dakota)			
Resource	Alternative		
	B	C	D
Cultural Resources	significant impact	significant impact	significant impact
Aesthetics	significant impact	significant impact	significant impact

Alternative D would require new grade crossings at 10 public roadways and would expand 98 existing public grade crossings from one set of tracks to two sets. Between 6 grade crossings (at the 20 million tons level) and 21 grade crossings (at the 100 million ton level) would experience a significant reduction in crossing safety. Alternative B would have a significant reduction in crossing safety at 1 grade crossing at 20 million tons and 2 grade crossings at both 50 and 100 million tons. Alternative C would result in no significant reductions in grade crossing safety. Additionally, the expansion of 98 existing grade crossings to two sets of tracks under Alternative D would potentially increase the number of train events at that grade crossing resulting in a greater number of vehicle delay occurrences.

As illustrated above in Table 6-2, Alternatives B and C would have greater impacts than Alternative D to soils, agricultural land use, Federal lands, wetlands, and possibly cultural resources. Alternatives B and C would disturb over 12,000 acres verses approximately 5,600 acres for Alternative D. Alternatives B and C would also have greater impacts to agricultural land use, converting over 9,500 acres of rangeland and 1,100 acres of cropland verses approximately 6,400 acres of rangeland and 1,200 acres of cropland for Alternative D. Operational impacts of Alternatives B and C would also potentially be greater because farmers and ranchers along Alternative D already co-exist with an active rail line, while those along Alternatives B and C are not so adapted. Alternative D would convert the least amount of Federal lands to rail line right-of-way. Alternative D would also convert the least amount of wetlands, approximately 46.0 acres, to rail line right-of-way, compared to 48.5 acres and 101.8 acres for Alternatives C and B, respectively.

Because Alternative D would require less right-of-way, it would, in all probability, have less impact to cultural resources than the other alternatives. However, because Alternative D would be located within or along existing rail line right-of-way, there would be less flexibility to adjust the rail right-of-way, increasing the potential for resources discovered during the construction process to be damaged, destroyed, or require recovery. In contrast, the alignments of Alternatives B and C could be more easily adjusted to avoid identified cultural resources.

Although it is likely Alternative B and C would require recovery of some cultural resources located within the rail right-of-way that could not be avoided the ability to adjust Alternatives B and C somewhat during the actual construction process likely would allow DM&E to minimize disturbance to cultural sites. Construction of Alternative D would not allow such flexibility. Cultural resources potentially affected by this project could include those eligible for the National Register of Historic Places under the criteria of 36 CFR 60.4 of the National Historic Preservation Act, including resources pertaining to Native American traditional cultural properties and Native American sacred sites. Accordingly, SEA views the impacts of Alternatives B through D on cultural resources to be significant, with Alternative D having the greatest potential impact (because of difficulties inherent in the recovery process and less flexibility to adjust the alignment of that alternative).

Socioeconomic impacts from the proposed project would be beneficial. Socioeconomic impacts would include increased employment opportunities, increased tax base and revenues, and more spending for local goods and services. Because Alternative D would be the longest alternative, it would likely require a longer construction period, a larger work force, and a greater expenditure to cover material costs. Even though it utilizes or parallels existing rail line for most of its length, the cuts and fills required for construction of Alternative D, combined with its greater length, would result in this additional construction time and necessity for materials. Therefore, Alternative D would likely result in greater socioeconomic benefit than the other alternatives.

On the other hand, SEA's analysis shows that Alternative D would have greater impacts than Alternatives B and C to safety, residential and business land uses, paleontological resources, water resources, air quality, noise, and aesthetics. Residential land use impacts from Alternative D would be substantially higher than for the other Extension Alternatives. Alternative D would require conversion of approximately 143.0 acres of residential land to rail line right-of-way; Alternatives B and C would affect only 14.5 acres. Alternative D would be within 500 feet of over 900 residences, compared to 2 and 8 residences for Alternatives B and C, respectively. Alternative D would be the only alternative to require conversion of business land to rail line right-of-way, approximately 18.1 acres. Residential and business removals or relocations would also likely be necessary with Alternative D.

Alternative D would incorporate approximately 2,600 acres of lands with a Probable Fossil Yield Classification (PFYC) of 5, the classification having the highest potential, into rail line right-of-way, compared to approximately 1,000 acres and 1,800 acres for Alternatives B and C. Alternative D would cross 68 perennial and 707 intermittent streams, compared to 20 perennial and 623 intermittent streams for Alternative B and 14 perennial streams and 520 intermittent streams for Alternative C. However, Alternative D would be further from the Cheyenne River,

having only 13.5 miles of the route within 500 feet of the river, compared to 21.9 miles and 20.8 miles for Alternatives B and C, respectively.

Because Alternative D would be over 70 miles longer than the other Extension Alternatives, it would result in greater locomotive emissions than the other Extension Alternatives. While these locomotive emissions would not result in a significant deterioration to local air quality, they would contribute to regional haze and concerns for visibility at visually sensitive locations, such as national parks and wilderness areas within the project region. Therefore SEA analyzed the potential impacts that the emission of criteria pollutants, particularly oxides of nitrogen (NO_x) and particulate matter (PM) produced by locomotives burning fuel, would have on visibility. The results of SEA's analysis are set forth in Appendix E to this Draft EIS. As air emissions, especially NO_x and PM, can contribute to haze in the sky and reduce visibility, SEA conducted detailed modeling to determine if the proposed Extension Alternatives would result in any impairment to visibility at several visually sensitive areas, including areas designated as both Class I and Class II under the Prevention of Significant Deterioration increments.⁶ SEA's modeling considered the total emissions from operations along each of the Extension Alternatives at the three analyzed levels of coal transport (20, 50, and 100 million tons annually), the location of the alternatives in relation to the visually sensitive areas, local climatic and atmospheric conditions, and wind directions. The results of SEA's analysis indicated Alternative D could result in up to 79 days⁷ of visibility impairment (5 percent impairment) at sensitive areas in South Dakota and Wyoming, compared to only 36 and 31 days, respectively for Alternatives B and C, at 100 million annual tons of coal transportation.

⁶ Prevention of Significant Deterioration (PSD) increments are established by EPA. They provide the limit the amount emissions of a particular pollutant can be increased above the existing emission level for that pollutant in a particular county. However, they do not enable emissions for a particular pollutant to exceed the National Ambient Air Quality Standards (NAAQS) standards. A PSD Class I airshed is an area designated by Congress as having "special national or regional value from a natural, scenic, recreational, or historical perspective." Designation as a PSD Class I (Class I) area affords the area an increased level of protection for its air quality. All areas not designated as Class I are considered to be Class II areas. EPA has established emissions increase increments for both Class I and Class II areas, with Class I levels being less than those allowed for Class II areas.

⁷ A "day" in SEA's analysis represents impairment at one of the 8 airsheds (Badlands National Park, Sage Creek Wilderness Area, Wind Cave National Park, Northern Cheyenne Reservation, Mount Rushmore National Monument, Black Elk Wilderness Area, Jewel Cave National Monument, Devils Tower National Monument, Cloud Peak Wilderness Area) evaluated, at some point over a 24 hour period. If, for example, SEA's modeling showed impairment at 3 of the airsheds SEA evaluated on the same day, SEA calculated that 3 days of impairment would result. Three days of impairment would also result if 1 area had 2 days of impairment and another area had 1 day of impairment or 3 different areas each had 1 day of impairment.

Alternative D would also have significantly greater noise impacts than Alternatives B or C. Alternative D would expose 624 noise sensitive receptors to horn and wayside average daily noise levels of greater than 65 dBA and 260 noise sensitive receptors to similar noise at a level greater than 70 dBA, both at 100-million tons of coal operation. By comparison, Alternative B, which would have greater noise impacts than Alternative C, would only expose 10 noise sensitive receptors (exposed to both horn and wayside noise) to average daily noise levels of 65 dBA or greater, and only 3 noise sensitive receptors to noise levels greater than 70 dBA, again at the 100-million ton level of operation.

Each Extension Alternative would have some impact on the aesthetics of the project area. These impacts would include introducing a rail line into the existing landscape, potentially creating an unnatural visual intrusion. Operation of the project would introduce the sights and sounds of frequent operating trains into an area that is now generally quiet and undeveloped. Because the project area is largely pristine and unspoiled, the area currently allows the public an opportunity to sense vastness, solitude, and remoteness.

Alternative D would have less impact on the aesthetics of the area than the other Extension Alternatives because it would utilize existing, operating rail corridors for much of its length. Therefore, Alternative D would generally not present a new visual intrusion into the landscape. However, Alternative D would detract indirectly from the visibility at a number of parks in the region. Chapter 4 provides a more complete discussion of the potential air quality impacts of the Extension Alternatives. Because Alternative D is longer than either Alternative B or C, it would generate greater air emissions and create greater visual impairment at Badlands National Park, Black Elk Wilderness Area, and Wind Cave National Park in South Dakota, all classified as "Class I airsheds" or areas of important visual quality.

Although Alternative D would utilize existing rail line corridor for approximately 251.3 miles of its total length of 353.4 miles, the greater length of this alternative (over 70 miles longer than Alternatives B and C), combined with the numerous communities through which it would be required to pass and the lack of flexibility to avoid sensitive areas that have developed along these rail corridors, results in Alternative D having the most significant potential environmental impacts. While some of the impacts of each of the Extension Alternatives could be reduced through imposed mitigation, such as erosion control measures and reseeding to minimize soil loss, other impacts such as reductions in air quality, increases in noise, and reductions in grade crossing safety would be both difficult and extremely costly to mitigate. In addition, because of its substantially longer, more circuitous route, Alternative D may not meet one of the stated purposes of the proposed rail line expansion, which is to efficiently deliver low sulphur coal from Wyoming's Powder River Basin to utility markets located further east (See Board's December 10, 1998 decision at 23 n. 44). According to DM&E, Alternative D adds "such significant capital

costs and operating inefficiencies” to make the alternative unfinanceable (DM&E Comment dated June 9, 1999, Applicant Comments on Alternative Routes Analysis, at Appendix A, p. 5). In sum, because the environmental impacts of Alternative D would be considerably greater and more difficult to mitigate than those of either Alternative B or C, and because it may fail to meet the Applicant’s purpose and need for the proposal, SEA preliminarily concludes that Alternative D would not provide an environmentally preferable alternative and has eliminated it from further consideration.

Elimination of Alternative D left SEA two Extension Alternatives to consider, Alternative B and Alternative C. As has been previously discussed, Alternative C was developed by modifying Alternative B – DM&E’s identified preferred route – to avoid sensitive environmental areas identified during the scoping process. Because of constraints discussed in Chapter 2, much of the alignments for Alternatives B and C are generally the same, approximately 105.4 miles. In determining which resources would be significantly impacted by each of these alternatives and comparing the type and level of environmental impacts, SEA preliminarily concludes that both Extension Alternatives would have potentially significant impacts to geology, soils, paleontological resources, land use, water resources, wetlands, air quality (visibility), vegetation, cultural resources, and aesthetics. In addition, both alternatives could have potentially significant impacts to threatened and endangered species. As discussed below, however, some of these potentially significant impacts could be reduced or eliminated through mitigation (see Chapter 7).

Safety

Alternative B would have a significant reduction in crossing safety at 1 grade crossing at 20 million tons and 2 grade crossings at both 50 and 100 million tons. Alternative C would result in no significant reductions in grade crossing safety at any level of operation.

Geology

The potential impacts to geology involve construction of new rail line across areas with a potential for slumping and landslides. Improper design and construction through these areas could result in slope slumping and landslides, which could result in damage to the rail line, safety problems, and long-term maintenance problems because the soil could be difficult to stabilize. Alternative C would involve construction within approximately 412.1 more acres of such areas than Alternative B (2,390.3 acres versus 1,978.2 acres). However, engineering and design solutions exist to address concerns regarding areas susceptible to slumping and landslides. Moreover, DM&E has indicated that it intends to undertake extensive geological investigations to identify these areas and appropriate methods to ensure soil stability. Therefore, while the potential for significant impacts exists, SEA does not believe such impacts actually would occur,

nor does it consider the differences in impacts between Alternatives B and C to be significant regarding this issue.

Soils

Soil impacts from both Alternatives B and C also would be significant, although again, very similar. Alternative B would disturb approximately 12,887.3 acres of soil (much of which would be reseeded following construction) including conversion of 1,013.3 acres of prime farmland to rail line right-of-way. Alternative C would disturb 12,790.3 acres of soil, including conversion of 1,071.5 acres of prime farmland to rail line right-of-way. Although soil disturbance — which increases the potential for erosion — would take place on a substantial amount of land, it would not occur all at once because rail line construction would occur in phases, as explained earlier in Chapter 1. Additionally, various measures are available to mitigate for soil disturbance, including erosion control measures, reseeded, and limiting construction activities to the right-of-way.

Paleontologic Resources

In addition, both Extension Alternatives have the potential to significantly impact paleontological resources. Alternative C would likely result in a greater level of impact as it would involve disturbance in the form of excavation and earthmoving activities on approximately 1,837.6 acres with a PFYC (Probable Fossil Yield Classification) of 5. Alternative B, by comparison, would potentially affect only 1,061.8 acres of PFYC 5 areas. Alternative C would potentially affect approximately 116.4 acres within the Thunder Basin Special Interest Area, a parcel of land managed by the USFS and classified as a Special Interest Area (SIA) due to its fossil resources. Alternative B would also cross this SIA. It would potentially impact slightly less of the area, 96.9 acres, but overall impacts to the SIA would be similar between the two alternatives. Thus, SEA has determined both Alternatives B and C have the potential to have significant impacts to paleontological resources, with Alternative C potentially having the greater impact.

Land Use

SEA has further determined that both of the Extension Alternatives would have significant impacts to land use, specifically agricultural land use, and to Federal lands managed by the USFS. Alternative B would have the greatest impact to agricultural activities, including ranching and farming. Alternative B would convert 11,229.1 acres of rangeland and 1,149.0 acres of cropland to rail line right-of-way. It would affect 89 Federal grazing allotments, resulting in the loss of 2,707.3 acres of Federal grazing land and 563.7 acres per animal use month (AUMs). By

comparison, Alternative C would convert approximately 9,568.9 acres of rangeland and 1,323.6 acres of cropland to rail line right-of-way. Alternative C would affect 66 Federal grazing allotments, amounting to a loss of 2,520.0 acres of Federal land and 491.2 AUMs. Although differences in these alternatives exist, SEA believes that the differences are not substantial. Additionally, DM&E has advised SEA that to minimize project impacts to landowners, families, and ranching operations, it voluntarily agrees to compensate landowners for not only land included in the rail line right-of-way but also for any reductions that would occur to the overall value of the ranch or farm due to the presence and inconvenience of the rail line. DM&E has also indicated it will work with landowners to develop measures to provide for movement of livestock and equipment from one side of the rail line to the other and replace or restore fencing, water, and facilities that may be removed or isolated due to the location of the rail line. While this sort of voluntary mitigation may not eliminate all the impacts to agricultural land use or render them insignificant, it would reduce potentially significant adverse impacts associated with both Alternatives B and C.

Federal Lands

Potential impacts to Federal land, particularly lands managed by the U.S. Forest Service (USFS), would differ between Alternatives B and C. Alternative B would cross 51.9 miles of USFS land, converting approximately 2,516.4 acres of USFS land to rail line right-of-way. Alternative C would cross only 38.9 miles of USFS land and convert approximately 1,886.1 acres to rail line right-of-way. Additionally, Alternative B would cross two USFS RARE II areas, likely eliminating them from consideration for inclusion in the National Wilderness Preservation System, since these areas would no longer be free from development or “unaffected by human manipulation,” as defined by the Wilderness Act. For a discussion and explanation of RARE II (Appendix L). Alternative C would likely only affect one RARE II area. Based on its analysis to date, SEA preliminarily concludes that both alternatives would have significant impacts to Federal land, with Alternative B having the greater impact.

Water Resources

Similarly, potential impacts to water resources would be significant under either Extension Alternative. Based on input from the USFS, the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (COE), South Dakota Department of Environment and Natural Resources, and South Dakota Department of Game, Fish and Parks (SDGFP), SEA determined that potential impacts to the Cheyenne River are of particular concern. As both alternatives would have the same number of crossings of the Cheyenne River, SEA used the number of stream crossings and the length of the alternatives within 500 feet of the river as indicators of the potential for impacts to the river. SEA has determined that Alternative B would have the greater

potential to affect the Cheyenne River. Alternative B would have 20 crossings of perennial streams and 623 crossings of intermittent streams. Alternative C would cross 14 perennial streams and 520 intermittent streams. Alternative B would be within 500 feet of the Cheyenne River for approximately 21.9 miles; Alternative C would be within this distance for 20.8 miles. Various mitigation measures exist that could minimize impacts to waterways, including erosion and sedimentation control measures, reseeding, and in-stream work restrictions or limitations. While such measures likely would minimize the potential project impacts to water resources, Alternative B, even with mitigation, would have a greater impact on water resources. Alternative B has more stream crossings and more of the alignment falls within 500 feet of the Cheyenne River than Alternative C. These factors provide more opportunities for impacts to result from the project. Because of the importance of the Cheyenne River to natural and human resources in the region, including threatened and endangered species, riparian habitats, fisheries, irrigation and farming, and water supply (particularly for the Pine Ridge Reservation), SEA believes any differences in Alternatives B and C's potential to affect the river is significant.

Wetlands

Significant impacts to wetlands would result from both Alternative B and C. However, Alternative B would have significantly greater impacts than Alternative C. The potential loss of approximately 101.8 acres of wetlands would be more than twice the approximately 48.5 acres of wetlands lost from Alternative C.

Air Quality

SEA considered potential impacts to air quality in two ways. SEA first considered the actual amounts of criteria pollutants that would be emitted due to combustion of fuel by locomotives to generate the power necessary to transport coal over either Alternative B or C. SEA compared these total emissions to the EPA's major source thresholds for stationary sources, the National Ambient Air Quality Standards, and the Prevention of Significant Deterioration emissions increments for Class II airsheds. SEA's analysis relating to actual air emissions for the Extension Alternatives is discussed in detail in Chapter 4. The results of these comparisons indicated that neither of the Extension Alternatives would have an adverse impact on air quality.

While emissions themselves would not occur at levels considered to be significant, locomotive emissions can potentially contribute to impairment of visibility at sensitive areas such as national parks and wilderness areas, as previously discussed. Therefore SEA analyzed the potential impacts that the emission of criteria pollutants, particularly oxides of nitrogen (NO_x) and particulate matter (PM) produced by locomotives burning fuel, would have on visibility. As air emissions, especially NO_x and PM, can contribute to haze in the sky and reduce visibility, SEA

conducted detailed modeling to determine if the proposed Extension Alternatives (Alternatives B and C remain for comparison) would result in any impairment to visibility at several visually sensitive areas, including areas designated as both Class I and Class II under the PSD increments. SEA's modeling considered the total emissions from operations along each of the Extension Alternatives at the three analyzed levels of coal transport (20, 50, and 100 million tons annually), the location of the alternatives in relation to the visually sensitive areas, local climatic and atmospheric conditions, and wind directions.

SEA's analysis showed some differences in visibility impairment would result from Alternatives B and C. Nevertheless, potential impairments to visibility at sensitive airsheds are close to identical for the two alternatives. Neither Alternative B or C would result in any visual impairment above 5 percent at any sensitive airsheds at the 20 million annual ton level of train operations. At the 50 million annual ton level of operation, Alternative B is expected to cause 5 days (4 at Class I airsheds) of 5 percent visibility impairment and 0 days of 10 percent impairment, compared to 4 days (3 at Class I airsheds) and 0 days, respectively, for Alternative C. Alternative B is expected to have 36 days (19 at Class I airsheds) of 5 percent visibility impairment and 5 days (4 at Class I airsheds) of 10 percent impairment at the 100 million annual ton level. By comparison, Alternative C would have 31 (16 at Class I airsheds) and 4 (3 at Class I airsheds) days, respectively, of impairment at the 100 million annual ton level of operation. While these impacts would be adverse, they generally would be the same between Alternatives B and C.

Vegetation

Construction of either Alternative B or C would require a substantial amount of vegetation to be cleared, much of which would be converted to rail line right-of-way. Because revegetation measures could be implemented to reestablish vegetative cover, the potential affect of loss of vegetation could be mitigated. Therefore, this project likely would not result in significant adverse impacts for common vegetative communities found throughout the area, including grassland, coniferous forest, and sagebrush shrublands. However, deciduous woodlands are uncommon in the project area and now provide valuable habitat for wildlife, including important wildlife such as wild turkey, deer and elk, raptors, and eagles. The USFWS and South Dakota Department of Game, Fish and Parks have expressed concerns that efforts to mitigate losses of deciduous woodland, particularly those associated with riparian areas, might be unsuccessful. Accordingly, it appears that the potential loss of deciduous woodlands would have significant impacts. Both Alternatives B and C would affect deciduous woodlands. Alternative B would likely result in the loss of approximately 24.2 acres, while Alternative C would convert 33.9 acres of deciduous woodland to rail line right-of-way. While this is not a significant difference, Alternative C nonetheless would have greater impacts on this resource than Alternative B.

Cultural Resources

As discussed in Chapter 4, there is a high probability of adverse effects to cultural resources under either Alternative B or C because numerous archaeological sites are known to exist in the area of the alternatives. However, procedures for identification and mitigation, including those in the Memorandum of Agreement, Programmatic Agreement, and Identification Plan (Appendices I and J) that have been developed through coordination between SEA, interested Tribes, the cooperating agencies, the Advisory Council on Historic Preservation, State Historic Preservation Offices, and DM&E for this project would provide acceptable measures to address potential impacts to cultural resources.

Socioeconomics

As noted previously, construction and operation of any of the Extension Alternatives would have potentially substantial positive, or beneficial, impacts to the socioeconomics of the regions. The economic report (Appendix M) prepared by DM&E for the proposed project did not address the various route alternatives, only the general impacts of the project. However, because Alternatives B and C are similar in length, alignment, and the counties through which they pass, there likely would be no substantial differences in the socioeconomic impacts of these alternatives.

Aesthetics

Both Alternative B and C would create a visual intrusion into the landscape. Train construction and operation would affect the scenic character of the project area as well as the remoteness and feeling of vastness this undeveloped area currently provides. Because of the similarities in the route alignments for Alternatives B and C, SEA has determined that the impacts of the two alternatives on aesthetics would be generally the same. The only real difference in the aesthetic impacts of these alternatives would be that Alternative B alone would involve new rail line construction along the Cheyenne River north of the community of Red Shirt, adjacent to a stretch of the river now eligible for classification as wild and scenic. Construction and operation of that alternative would likely eliminate this stretch of river from eligibility for that classification. Moreover, it would be virtually impossible to mitigate the impact of the rail line on aesthetics in this generally pristine area.

Threatened and Endangered Species

Because of the similarity of the two alternative alignments, potential impacts to threatened and endangered species would generally be similar for Alternatives B and C. However, Alternative B would have potentially adverse impacts on the black-footed ferret. Alternative B would cross an area identified for reintroduction of this species. Construction and operation of a rail line across this area has been noted by the USFWS and USFS as potentially jeopardizing efforts to reintroduce the species into the wild. By contrast, Alternative C would avoid this area and likely have little, if any, impact on black-footed ferrets.

6.2.1.4 Preliminary Conclusions

After considering all the potential environmental impacts of Alternatives B and C based on its analysis to date, SEA preliminarily concludes that construction and operation of either of the Extension Alternatives (Alternatives B and C) would potentially result in significant environmental impacts to various resources (Table 6-1). Moreover, if SEA's recommended mitigation is imposed and implemented, this would likely reduce some but not all of the potential impacts, in some instances to levels below significance, under both Alternatives B and C. Even with mitigation, however, both alternatives would result in some potential significant adverse environmental impacts, particularly in such areas as noise, land use, aesthetics, and cultural resources. Therefore, SEA, based on the information available at this time, does not believe that either of the two reasonable and feasible Extension Alternatives — Alternatives B and C — can be viewed as environmentally preferable. Nevertheless, Alternative B would have greater potential impacts to safety, Federal lands, water resources, and endangered species than Alternative C, which was specifically developed to avoid some of these impacts. As a result, SEA preliminarily concludes, based on the information available to date, that if the new construction receives final approval, Alternative C would appear to be the least environmentally intrusive Extension Alternative.⁸

SEA requests additional comments on these above conclusions from other agencies, Tribes, the public, and other interested parties. If appropriate, SEA will make a final recommendation on a preferred alternative, based on the additional comments and any further analysis that may be necessary, in the Final EIS.

⁸ As discussed above in Section 6.2.1.2, the No-Action Alternative likely would result in significant environmental impacts in view of the likely continued deterioration of DM&E's existing rail line. Moreover, under the No-Action Alternative, DM&E would not be able to meet the project purpose or need.

In addition, as part of its decision-making process for this project, the USFS, a cooperating agency, assisted in the preparation of this EIS. It is USFS policy to identify a preferred alternative in a Draft EIS. The USFS's role in preparing the Draft EIS for this project has included preparing the "Resource Technical Reports and Impact Assessment" for the new rail line Extension Alternatives, which can be found at Appendix L. SEA reviewed the USFS analysis and supplemented it with its own analysis to assess the anticipated impacts of the rail line Extension Alternatives and to preliminarily determine whether one of the Extension Alternatives would be environmentally preferable. By letter dated February 14, 2000, USFS advised SEA that it had identified the No-Action Alternative as its preferred alternative, based on the presence of existing rail lines accessing the Powder River Basin and the fact that those rail lines are adding capacity, project inconsistency with existing and future management plans for the Buffalo Gap and Thunder Basin National Grasslands, and overall project impacts to USFS lands. However, USFS indicated that, should the Board's final decision the project find that the project is in the national public interest, and therefore, approve the project, the USFS would consider Alternative C as the preferred alternative, subject to some modifications (discussed later as they relate to other specific components of the project) and imposition of certain mitigation measures (set forth at Chapter 7).

6.2.2 Alternative Route Variations

Three alternative alignments for extending the existing DM&E rail line into the Powder River Basin have been developed and analyzed in this Draft EIS as discussed above. They are Alternatives B, C, and D, as discussed above. In addition, for various reasons discussed below, short variations in the alignments have been developed and evaluated. These variations address specific engineering and environmental issues associated with the Spring Creek area in South Dakota, Hay Canyon area in South Dakota, Black Thunder Mine access in Wyoming, and North Antelope Mine access in Wyoming. Each of these areas and the alternative alignment variations proposed for them are discussed in this section.

As explained in detail in Chapter 2 and in the USFS Resources Technical Reports and Impact Assessment in Appendix L, during scoping and consultation, coordination and field inspections with Federal and state agencies, it was suggested by the cooperating agencies, USFWS, and SDGFP that three small portions of Alternative C, as originally proposed, could result in unacceptable and perhaps irreplaceable impacts to wetland/riparian areas and important wildlife habitats in South Dakota. The three portions are included: (1) Spring Creek drainage in Custer County, South Dakota, west of Phiney Flat; (2) Hay Canyon in Fall River County, South

Dakota, northeast of Smithwick; and (3) Cheyenne River pinch points⁹ on the SMS Ranch in Pennington County, South Dakota, east of Holcomb Flats.

Following SEA's consultation with appropriate agencies, DM&E reevaluated the alignment of Alternative C to determine whether variations in the route could be developed to reduce impacts to wetlands and wildlife habitat. DM&E identified feasible route variations to avoid adverse impacts in the Spring Creek drainage and Hay Canyon areas. DM&E stated that it would not be possible to develop an economically viable alternative to avoid the Cheyenne River pinch points on the SMS Ranch. Moreover, DM&E proposed two alternatives to access the Black Thunder Mine and North Antelope Mine, both in Wyoming, which differ from the original proposed alignment. The following discussion presents SEA's preliminary conclusions on these variations¹⁰ that DM&E proposed to avoid potential adverse environmental impacts.

6.2.2.1 Spring Creek and Phiney Flat Alternatives in South Dakota

As discussed in more detail in Chapter 2, the Spring Creek Segment was originally proposed as part of the original alignment of Alternatives B and C (Figure 6-3). Due to concerns raised by the cooperating agencies, USFWS, and SDGFP for the potential impacts of this segment in the area where it would follow Spring Creek, DM&E developed the Phiney Flat Alternative to avoid the Spring Creek area. SEA has evaluated the potential environmental impacts of both the Spring Creek Segment — originally developed by DM&E as part of both Alternatives D and C — and the Phiney Flat Alternative DM&E proposed to avoid adverse environmental impacts identified during scoping and consultation with agencies. A detailed discussion of this analysis is presented in Chapter 4 and summarized in Table 5.1-2. Table 6-3 provides a brief overview of the Spring Creek Alternatives.

Based on its environmental impact analysis, SEA preliminarily concludes that both Spring Creek Alternatives would have significant impacts to several environmental resources. These resources include geology, soils, paleontological resources, water resources (particularly Spring Creek), wetlands, vegetation, and cultural resources.

⁹ "Pinch points" refers to these areas being "pinched" between the Cheyenne River and its sideslope. These are areas where the bends in the Cheyenne River bring the river right up to the west sideslope up out of the river, resulting in a steep bank and a narrow, if any floodplain. Area topography dictates that any new rail line following the Cheyenne River drainage cross these areas. Such construction would require that the rail bed be cut into the sideslope of the river and be located immediately adjacent to and above the river, thus being "pinched" between the river and the sideslope.

¹⁰ Since it does not appear that an environmentally viable alternative to the Cheyenne River pinch points on the SMS Ranch is available, no such alternative is addressed below.

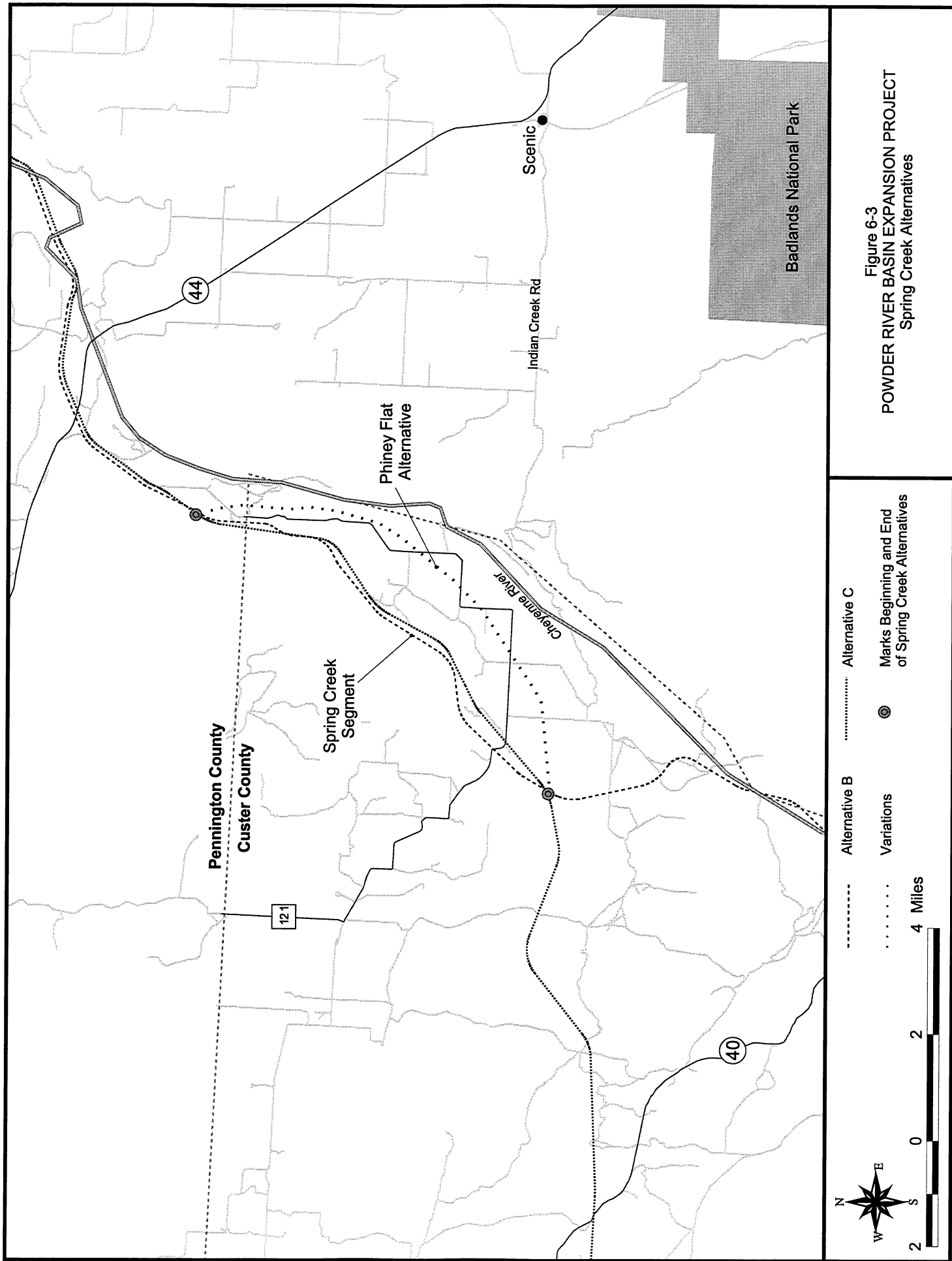


Figure 6-3
POWDER RIVER BASIN EXPANSION PROJECT
Spring Creek Alternatives

Table 6-3
Summary Highlights of Environmental Impacts
Spring Creek Alternatives

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Spring Creek Segment	Segment of Alternative B, crosses and follows Spring Creek floodplain	Provide efficient grade for new rail line extending DM&E's existing system.	Geological Hazards, Soils, Paleontological Resources, Land Use, (Agriculture, Federal Lands), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	While both alternatives would have potentially significant impacts to environmental resources, the Phiney Flat Alternative would have far fewer impacts that would be more capable of being mitigated, therefore SEA preliminarily concludes that the Phiney Flat Alternative would be environmentally preferable.
Phiney Flat Alternative	Segment of Alternative B moved out of Spring Creek drainage area	Avoid sensitive environmental areas (wetlands, riparian areas) along Spring Creek	Geological Hazards, Soils, Paleontological Resources, Land Use (Agriculture), Surface Water, Air Quality, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	

Specifically, both the Spring Creek Segment and the Phiney Flat Alternative have the potential to adversely impact paleontological resources. As discussed in greater detail in Chapter 4, both alternatives cross formations with a PFYC (Probable Fossil Yield Classification) of 5. Because both the Spring Creek Segment and the Phiney Flat Alternative would cross private lands, paleontological resources found there would not be afforded the same level of protection as if they were found on Federal land. This could increase the likelihood that these resources would be damaged or destroyed during construction of either the Spring Creek Segment or the Phiney Flat Alternative.

In comparing the two alignments (and summarizing some of the impacts discussed in Chapter 4), SEA has determined that the Phiney Flat Alternative would convert 247.0 acres with a PFYC of 5 to rail line right-of-way, approximately 87.0 acres more than the Spring Creek Segment (160.0 acres). Because of the difficulty of protecting paleontological resources along these alternatives, SEA considers this difference to be substantial. Therefore, SEA preliminarily concludes that the Phiney Flat Alternative would have potentially greater impacts.

Potential impacts to water resources and wetlands would be for more significant if the Spring Creek Segment is constructed. The Phiney Flat Alternative would prevent significant impacts to Spring Creek by eliminating the need for 20 crossings of this stream and many stream channel alterations. The Phiney Flat Alternative would have only one crossing of a perennial stream (Spring Creek), and 13 intermittent stream crossings. In contrast, the Spring Creek Segment would have as many as 26 perennial stream crossings (25 of Spring Creek itself), and 44 intermittent stream crossings.

USFWS and SDGFP raised concerns about the number of stream crossings that would occur with the Spring Creek Segment. Potential impacts from these stream crossings include reduced water quality, loss of important wildlife habitat, and loss of wetlands. The Phiney Flat Alternative was developed expressly to avoid or minimize impacts to Spring Creek. SEA concurs with these agencies that the Spring Creek Segment would have significant impacts to water resources, and that these would be significantly greater impacts than the Phiney Flat Alternative.

The Spring Creek Segment also would have significant impacts to wetlands, substantially more than would result from the Phiney Flat Alternative. The Spring Creek Segment would result in the loss of approximately 9.7 acres of forested wetlands which could be difficult to replace. The Phiney Flat Alternative, by comparison, would impact only approximately 1.0 acre of emergent wetlands, which are common in South Dakota and generally easy to replace.

As for impacts to vegetation, SEA has determined that the Spring Creek Segment would have potentially significant impacts to deciduous woodlands. The Spring Creek Segment would

cause the loss of approximately 9.7 acres. While this amount of woodland may be insignificant in other areas of the project, because these woodlands are also wetlands, exist in a riparian corridor, provide valuable wildlife habitat, are rare in southwest South Dakota, and may be difficult to mitigate, SEA considers this a potentially significant environmental impact. In contrast, the Phiney Flat Alternative would not impact any woodland vegetation.

In summary, SEA, at this time, concludes that the Spring Creek Segment would have significant impacts to water resources, wetlands, and vegetation. The Phiney Flat Alternative would largely avoid these impacts. The Phiney Flat Alternative would potentially have substantially greater impacts to paleontological resources, based on its alignment through formations known to have a high potential for containing significant fossil resources. The Spring Creek Segment, however, likely would also have some potential significant impacts to paleontological resources. While both alternatives would have potentially significant impacts to environmental resources, the impacts of the Phiney Flat Alternative are fewer and more capable of being mitigated than the impacts of the Spring Creek Segment. Therefore, SEA preliminarily determines that the Phiney Flat Alternative would be environmentally preferable to the Spring Creek Segment (Table 6-3).

6.2.2.2 Hay Canyon Segment, Oral Segment, and WG Divide Alternative in South Dakota

Due to concerns of the cooperating agencies, the USFWS, and SDGFP, the potential impacts to wetlands, riparian areas, the Cheyenne River, and the Angostura Irrigation District lands associated with route alignments in the Hay Canyon area (see Chapter 2), three alternative alignments were developed by DM&E and evaluated by SEA (Figure 6-4). A detailed discussion of this analysis are presented in Chapter 4 and summarized in Table 5.1-3. Table 6-4 provides a brief overview of the Spring Creek Alternatives. These alignment variations were developed such that they could be used with either Extension Alternative B or C, should one of these alternatives be approved. The Hay Canyon Segment was part of DM&E's original proposal for the new rail line extension in Alternative C. During the scoping process, SEA and the cooperating agencies identified concerns with the Hay Canyon Segment. Because of these concerns, SEA and the cooperating agencies coordinated with DM&E for the development of an alternative to avoid or minimize impacts in Hay Canyon. The 14.7-mile WG Divide Alternative was developed as a result of this coordination. Upon review of the WG Divide Alternative, however, SEA became concerned this alternative had the potential to impact lands associated with the Angostura Irrigation District (District), as discussed further in Chapter 2.

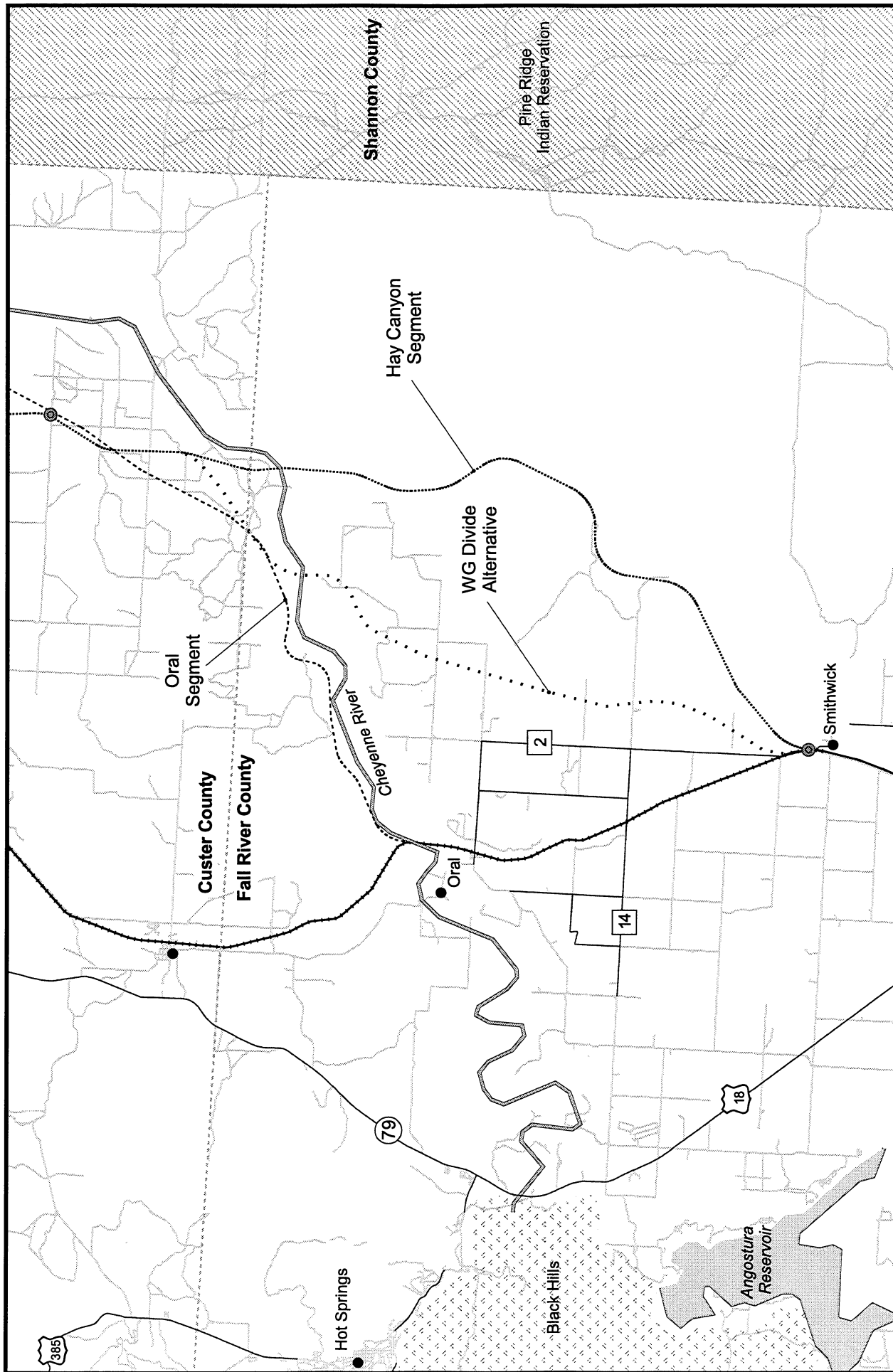


Figure 6-4
POWDER RIVER BASIN EXPANSION PROJECT
Hay Canyon Alternatives

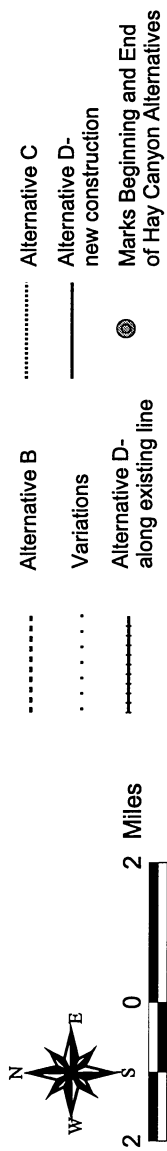


Table 6-4
Summary Highlights of Environmental Impacts
Hay Canyon Alternatives

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Hay Canyon Segment	Alignment following Hay Canyon drainage from north of the Cheyenne River south to Smithwick	Provide suitable alignment while avoiding environmentally sensitive areas along the Cheyenne River	Geological Hazards, Soils, Paleontological Resources, Land Use (Agricultural, Federal Lands), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Cultural Resources, Viewsheds/Scenic Values	Each of the alternatives would have significant environmental impacts, however to different resources. Because SEA would have to make a value judgement between wetlands/ riparian areas or irrigated lands, SEA requests additional comments from agencies and the public to assist in identifying an environmentally preferable alternative.
Oral Segment	Alignment following the Cheyenne River to Oral, then using existing rail line south to Smithwick	Provide suitable alignment while using as much of the existing DM&E rail line as practicable, avoid irrigated lands and environmentally sensitive areas along Hay Canyon	Geological Hazards, Soils, Paleontological Resources, Land Use (Agriculture, Federal Lands), Surface Water, Wetlands, Air Quality, Noise, Vibration, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	
WG Divide Alternative	Alignment following WG Divide drainage from north of the Cheyenne River south to Smithwick	Provide suitable alignment while avoiding environmentally sensitive areas along the Cheyenne River and Hay Canyon	Geological Hazards, Soils, Paleontological Resources, Land Use (Agriculture, Federal Lands), Air Quality, Cultural Resources, Recreation, Viewsheds/Scenic Values	

The District receives water from and is responsible for repayment of construction, operation, and maintenance costs for the Angostura Dam, Angostura Reservoir, and irrigation facilities, which are under the jurisdiction of the U.S. Department of Interior, Bureau of Reclamation (Reclamation). SEA determined that the WG Divide Alternative would potentially impact irrigation facilities and irrigated lands, affecting the ability of the District to meet its commitments to Reclamation for repayment of facility costs. Because of this, Reclamation expressed concerns regarding the impacts of the WG Divide Alternative and requested an alternative that would avoid or minimize impacts to the District. In evaluating potential alternatives, SEA concluded that both the 18.5-mile Hay Canyon Segment and the 20.5-mile Oral Segment could address the concerns of Reclamation. Additionally, SEA determined that the use of the Oral Segment, originally proposed as part of the alignment for Alternative B, appeared to also be feasible for use with Alternative C and would avoid the Hay Canyon area and also cross minimal lands within the District. Therefore, the Oral Segment was retained as a third alternative alignment for this portion of Alternative C.

The following discussion presents a summary comparison of the significant adverse environmental impacts that could potentially result from the Hay Canyon Segment, Oral Segment, and WG Divide Alternatives. The discussion concludes with SEA's determination of which, if any, of the three alternatives can be identified as environmentally preferable.

As discussed in more detail earlier in this Draft EIS, all three alternatives would result in significant adverse environmental impacts to soils, paleontological resources, water resources, wetlands, vegetation, irrigated land, and cultural resources. The degree of impact would be similar for all three alternatives for most of these resources. For those resources for which the three alternatives have different potential impacts (geological hazards, soils, and cultural resources), mitigation measures are available to minimize or eliminate the differences in impact. Therefore SEA has determined that no substantial difference in the potential significant impacts to geological hazards, soils, and cultural resources exist among the Hay Canyon, Oral Segment, and WG Divide Alternatives.

Because all three alternatives cross formations with a PFYC (Probable Fossil Yield Classification) of 5, significant impacts to paleontological resources could occur regardless of whether the Hay Canyon Segment, Oral Segment, or WG Divide Alternatives were constructed. Only the Oral Segment, however, would cross Federal lands (0.3 miles). All other sections of the Hay Canyon and WG Divide Alternatives would cross private lands where paleontological resources are afforded less protection than on Federal lands. This would increase the likelihood that these resources would be damaged or destroyed during construction. In comparing the alternatives, SEA has determined that the Oral Segment would convert 887.3 acres with a PFYC of 5 to rail line right-of-way, approximately 160.0 and 184.3 acres more than the Hay Canyon and

WG Divide alignments, respectively. Because of the lack of adequate mitigation to fully protect these resources along these alternatives, SEA considers the differences in acreage to be substantial, with the Oral Segment having the potentially greatest impact, followed by the Hay Canyon and then the WG Divide alignments.

SEA also considers water resources and wetlands to be potentially significantly impacted, particularly from the Hay Canyon and Oral Segment Alternatives. The WG Divide Alternative is not likely to pose a significant impact to water resources; this alternative crosses the Cheyenne River only once and is located over a mile from the Cheyenne River and Hay Canyon drainages. Also, the WG Divide Alternative would cross only one other perennial stream. The Hay Canyon Alternative would generally follow the Hay Canyon Drainage, crossing it 7 times. It crosses intermittent streams, many of which are tributaries to Hay Canyon, at 73 points. Approximately 6.5 miles of the Hay Canyon Alternative would be within the Hay Canyon drainage.

The Oral Segment would also have 7 perennial stream crossings, 1 of the Cheyenne River and 6 of Sand Creek. All perennial stream crossings for the Oral Segment would be along the existing DM&E rail line portion of this alternative. The Oral Segment would follow the Cheyenne River drainage for approximately 6.1 miles, which could result in other related adverse impacts such as reduced water quality, loss of important wildlife habitat, and loss of wetlands. The USFWS and SDGFP have expressed concern about these adverse impacts, particularly relating to the Hay Canyon Alternative.

With respect to wetlands, the Hay Canyon Alternative could adversely impact approximately 17.9 acres of wetlands, substantially more than would be lost from the Oral Segment (2.4 acres) or the WG Divide Alternative (3.2 acres). Additionally the USFWS and SDGFP, and U.S. Army Corps of Engineers (COE) have indicated that wetlands lost within Hay Canyon could be difficult to mitigate.

Impacts to vegetation would be similar to those for wetlands. USFWS and SDGFP have indicated that the Hay Canyon Alternative contains important riparian areas, uncommon in western South Dakota. These agencies have explained that the area potentially impacted by the Hay Canyon Alternative provides rare and valuable wildlife habitat that could not be adequately recreated if destroyed. SEA concurs with these agencies that impacts to vegetation in Hay Canyon constitute a potentially significant impact. Similarly, the Oral Segment could damage some riparian vegetation along the Cheyenne River, but the impact would be less severe because of the location of the vegetation that would be potentially affected by this alternative. The WG Divide Alternative would not have any impacts on riparian vegetation, except for minimal impacts where the alternative would cross the Cheyenne River.

Finally, all three of the alternatives would cross some irrigated lands. These lands are used to produce crops and hay through use of water provided by the District as part of the Angostura Dam and Reservoir Project. Reclamation is a water management agency responsible for balancing competing uses of water in the West. Reclamation works with the Angostura Irrigation District to manage the delivery and use of water generated by the dam and reservoir project. As discussed in Chapter 4, irrigators are assessed a fee for the amount of land they irrigate to cover the costs of delivering water. Crossing these lands and converting them to rail line right-of-way would change the amount of irrigable land, and therefore, the fee structure for all irrigators. Reclamation has expressed concern that the WG Divide Alternative would significantly affect irrigated lands. SEA agrees that, based on information contained in the USFS Resource Technical Reports and Impact Assessment (Appendix L), the WG Divide Alternative would have the most impacts, converting 305.5 acres of cropland to rail line right-of-way, and crossing 14 irrigated farm units amounting to removal of 233.0 acres of land from irrigation. By comparison, the Hay Canyon Segment would convert 87.3 acres of cropland, remove 135.0 acres of irrigated land, and cross 8 farm units. The Oral Segment would convert 218.2 acres of cropland, remove 30.0 acres of irrigated land, and cross 2 farm units. Because of the financial implications to the entire Angostura Irrigation District, SEA considers the potential impacts to irrigated land to be potentially significant.

In reviewing the differences among the three alternatives — Hay Canyon, Oral Segment, and WG Divide — SEA has determined that the Hay Canyon Alternative would likely have the most significant impacts to water resources, wetlands, and vegetation, that the Oral Segment also would potentially have significant impacts to these resources, and the WG Divide Alternative would not. For irrigated lands, the Hay Canyon Alternative would have minimal impacts, while the Oral Segment and WG Divide Alternatives would have nearly equal and potentially significant impacts.

As illustrated above, each of the three alternatives would have significant environmental impacts (Table 6-4). However, these impacts would affect different resources: wetlands and riparian areas of Hay Canyon potentially would be adversely affected by the Hay Canyon Alternative and irrigated lands in the Angostura Irrigation District potentially would be adversely affected by the WG Divide Alternative, and to a somewhat lesser extent, the Oral Segment.

To identify an environmentally preferable alternative in this Draft EIS from among these three alternatives, SEA would have to make a value judgement on whether wetland/riparian areas are more important to the environment than irrigable lands. SEA requests additional comment from agencies and the public to assist in identifying an environmentally preferable alternative. SEA will review and consider any comment and perform any additional analysis that is necessary for the Final EIS. SEA's identification of the environmentally preferred alternative from among

the Hay Canyon, Oral Segment, and WG Divide Alternatives will be made, if one preferred alternative can be identified, in the Final EIS for this project.

6.2.2.3 Black Thunder Mine Loop Alternatives in Wyoming

As part of its development of Alternative C, DM&E proposed two alternative routes for accessing the Black Thunder Mine, as described in Chapter 2: South Mine Loop and North Mine Loop. SEA has reviewed these alternatives and the potential impacts that each would have on environmental resources. SEA preliminarily concludes that, overall, neither alternative would have significant environmental impacts. However, for the reasons discussed below, SEA concludes that the Black Thunder North Mine Loop would be the environmentally preferable alternative (Table 6-5). The Black Thunder South Mine Loop would have greater impacts than the Black Thunder North Mine Loop (Table 5.1-4) to safety, geological hazards, soils, paleontological resources, land use, Federal lands, surface waters, wetlands, vegetation, wildlife (except raptors), transportation, cultural resources, and aesthetics.¹¹ These impacts are discussed in greater detail in Chapter 4 and are summarized in Table 5.1-4. SEA therefore concludes that the Black Thunder North Mine Loop would be the preferred environmental alternative.

6.2.2.4 North Antelope Mine Loop Alternatives in Wyoming

Also as part of its development of Alternative C, DM&E proposed two alternatives to access the North Antelope Mine, the East Mine Loop and West Mine Loop, as described in detail in Chapter 2. SEA has reviewed these alternatives and the potential impacts that each would have on environmental resources. SEA preliminarily concludes that, overall, neither alternative would have significant environmental impacts. While both alternatives would impact a variety of natural resources, these impacts would generally be minimal or could be appropriately mitigated. The West Mine Loop would have greater impacts than the East Mine Loop (Table 5.1-5) to safety, geological hazards, soils, paleontological resources, land use, surface waters, wildlife, threatened and endangered species habitat, and transportation.¹² These impacts are discussed in detail in Chapter 4 and summarized in Table 5.1-5). SEA therefore concludes that the North Antelope East Mine Loop would be the preferred environmental alternative (Table 6-6).

¹¹ SEA recognizes that the Black Thunder North Mine Loop would have greater impacts to Federal grazing pastures, state lands, and raptor nests. However, these impacts would be minimal.

¹² SEA recognizes that the North Antelope East Mine loop would have greater impacts to soils with an erosion hazard, number of Federal grazing pastures crossed, and wetlands converted to rail line right-of-way. However, these impacts would be minimal.

Table 6-5
Summary Highlights of Environmental Impacts
Black Thunder Mine Loop Alternatives

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Black Thunder South	Two spurs, one north of Hwy. 450 to access Jacobs Ranch Mine, one south along Hwy. 450 creating a second rail loading loop to access the Black Thunder Mine	To provide access to Black Thunder Mine, avoiding need to cross existing Jacobs Ranch Mine Loop	Geological Hazards, Soils, Paleontological Resources, Land Use (Rangeland/Grazing, Federal Lands, State Lands), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	Overall, neither alternative would have significant environmental impacts. However, because the North Mine Loop would have less overall environmental impacts, SEA preliminarily concludes the Black Thunder North Mine Loop would be the preferred environmental alternative.
Black Thunder North	Rail spur north of Hwy. 450 connecting to Jacobs Ranch Mine, continuing to the existing Black Thunder rail loop on the north side of Hwy 450	To provide access to Black Thunder Mine, minimizing new rail line construction	Geological Hazards, Soils, Paleontological Resources, Land Use (Rangeland/Grazing, State Lands), Surface Water, Air Quality, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	

Table 6-6
Summary Highlights of Environmental Impacts
North Antelope Mine Loop Alternatives

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
North Antelope East	Mine connection spur connecting to existing mine loop just west of Porcupine Reservoir	Provide rail access to the North Antelope Mine	Soils, Land Use (Rangeland/Grazing), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	Overall, neither alternative would have significant environmental impacts. However, because the East Mine Loop would have less overall environmental impacts, SEA preliminarily concludes the North Antelope East Mine Loop would be the preferred environmental alternative.
North Antelope West	Mine connection spur connecting to existing mine loop west of Porcupine Reservoir	Provide rail access to the North Antelope Mine	Soils, Land Use (Rangeland/Grazing), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Cultural Resources, Recreation, Viewsheds/Scenic Values	

6.2.3 Summary of SEA's Conclusions for Rail Line Extension Alternatives

This case is unique. Normally, the No-Action Alternative (here, Alternative A) simply continues the status quo. As explained in Chapter 1, however, the purpose of the Powder River Basin Expansion Project is not just to access coal mines and transport coal but also to provide the means for DM&E to rehabilitate its existing rail facilities. This rehabilitation is necessary due to the deteriorated condition of DM&E's existing system. Indeed, as the Board, in its December 10, 1998 decision, recognized, "absent the funds generated by this project, DM&E could cease to exist as a viable railroad."

The No-Action Alternative would not allow DM&E to satisfy any of its identified purposes and needs for this project. Not only would DM&E not construct new rail line into the Powder River Basin, providing additional competition for transport of the region's coal, but DM&E likely would not be able to rehabilitate its existing system. The No-Action Alternative would, therefore, prevent DM&E from providing continued, improved, and potentially safe service to its existing shippers. Nevertheless, SEA preliminarily concludes, based on the information available to date that, although the No-Action Alternative has its own potentially significant environmental impacts and would not meet the Applicant's purpose and need, it would be premature to reject it at this point, given the substantial adverse environmental impacts associated with all the Action Alternatives and the difficulty of effectively mitigating some of their impacts.

To identify an environmentally preferable alternative that would allow DM&E to extend its existing system to connect to coal mines in the Powder River Basin, SEA first evaluated the three Extension Alternatives, Alternatives B, C, and D and determined that each alternative would have significant impacts to several environmental resources. Because Alternative D would have the greatest potential environmental impacts due to its greater length, passing through numerous communities, and lack of flexibility to avoid sensitive areas, and to a lesser extent, because DM&E contends that Alternative D would not meet the purpose and need for the project, SEA has dropped Alternative D from consideration as a reasonable and feasible alternative.

Having eliminated Alternative D from consideration, SEA carefully evaluated the alignments of Alternatives B and C, as well as alternative alignments for the Spring Creek and Hay Canyon areas and to access the Black Thunder and North Antelope mines. After considering all the potential environmental impacts of Alternatives B and C, SEA preliminarily concluded that construction and operation of either Alternative B or C would potentially result in significant environmental impacts to various resources. Moreover, if SEA's recommended mitigation is imposed and implemented, this would likely reduce some, but not all, the potential impacts of both alternatives. Even with mitigation, then, both Action Alternatives would result in some

potentially significant adverse environmental impacts, particularly in such areas as noise, land use, and cultural resources that could not be mitigated to levels below significance. Consequently, SEA has decided at this time, that it cannot identify either Alternative B or C as environmentally preferable.

Nevertheless, SEA has noted that Alternative B would have greater impacts to safety, Federal lands, water resources, wetlands, and endangered species than Alternative C, which was specifically developed to avoid these impacts. As a result, SEA preliminarily concluded, that if the new construction receives final approval, Alternative C would appear to be the least environmentally intrusive Action Alternative for the new rail line in Wyoming and Western South Dakota.

With respect to the Spring Creek Alternatives (the Spring Creek Segment and the Phiney Flat Alternative), SEA determined that these alternatives would have generally the same potential environmental impacts except that the Spring Creek Segment would have greater impacts to water resources, wetlands, and vegetation. Therefore, SEA identified the Phiney Flat Alternative as the environmentally preferable alternative.

For the Hay Canyon area, SEA evaluated three alternatives: the Hay Canyon Segment, Oral Segment, and WG Divide Alternative. Although originally the Hay Canyon Segment and WG Divide Alternative were proposed as part of Alternative C and the Oral Segment was proposed as part of Alternative B, SEA determined the three Hay Canyon Alternatives could be used with either Alternative B or C. For these alternatives, SEA determined each would result in significant, albeit different environmental impacts. SEA, therefore, requested additional public and agency comment to consider before rendering a determination of a preferred alternative (if there is in the Final EIS).

SEA's analysis showed that there would be minimal differences in the alternatives evaluated for accessing Black Thunder Mine (Black Thunder South Mine Loop and Black Thunder North Mine Loop) and North Antelope Mine (North Antelope West Mine Loop and North Antelope East Mine Loop). SEA determined that the Black Thunder North and North Antelope East Mine Loops would be the environmentally preferred alternatives for accesses these mines, because these alternatives would have somewhat lesser environmental impacts. The other alternatives (Black Thunder South and North Antelope West) would have greater impacts to safety, geological hazards, soils, paleontological resources, surface waters, land use, and transportation.

In sum, based on its analysis to-date, SEA considers Alternative C, using the Phiney Flat Alternative, the Black Thunder North Mine Loop, and the North Antelope East Mine Loop as the least environmentally intrusive alternatives for extending DM&E's existing system to connect to the PRB coal mines. SEA has not eliminated the No-Action Alternative from consideration, and has requested additional comments on this alternative. SEA has deferred selection of a preferred alternative for the Hay Canyon area in order to consider additional public and agency comment on the potential environmental impacts and available mitigation for environmental resources along the Hay Canyon alternatives.

6.3 RECONSTRUCTION OF DM&E'S EXISTING RAIL SYSTEM IN SOUTH DAKOTA AND MINNESOTA

Currently, DM&E's existing rail line in central South Dakota and southern Minnesota is generally in poor condition. As explained in its Application, DM&E was created in 1986 through the acquisition of a railroad line that the Chicago and Northwestern Transportation Company had planned to abandon. DM&E states that, despite investments of over \$100 million, service and safety problems continue to plague the railroad. These problems, according to DM&E, result from many years of deferred maintenance by the previous owners. Rehabilitating its line with the goal of offering more efficient service to its existing shippers is one of DM&E's stated purposes for proposing the expansion of its rail line into Wyoming's Powder River Basin. According to DM&E, without the revenue generated from moving coal from the Powder River Basin east, it does not have the funds to improve its entire system (See Chapter 1).

As discussed earlier in the Draft EIS, under the ICC Termination Act of 1995, Pub. L. No. 104-88 (ICCTA), the Board has the authority to license new rail lines accessing new markets (49 U.S.C. 10901). Railroads are not required to seek the Board's authority to rehabilitate or improve their existing systems. When DM&E submitted its Application to the Board in February of 1998, it sought the Board's approval to construct and operate a new rail line extending from its existing rail line near Wall, South Dakota into the Powder River Basin (as well as associated rail construction proposals in Mankato and Owatonna, Minnesota). DM&E's Application did not seek the Board's approval of DM&E's plans to rehabilitate its existing rail line in South Dakota and Minnesota because railroads can repair, replace, or rehabilitate their existing rail lines without seeking Board authority.

In addition to its Application pending before the Board, however, DM&E is or will be seeking various other permits and approvals from the Federal cooperating agencies identified earlier in this Draft EIS. One of these agencies, the U.S. Army Corps of Engineers (COE), will consider an Application from DM&E to dredge and fill waters of the United States and adjacent wetlands as part of the reconstruction of existing rail infrastructure. As explained previously in

the Final Scope, served March 10, 1999, COE asked that this Draft EIS include an analysis of the potential environmental impacts from activities associated with DM&E upgrading or rehabilitating its existing system so that the COE will have the information it needs for its permitting decisions. Normally, the Board would not examine these impacts. However, in order to prepare a document that satisfies the regulatory requirements of all the cooperating agencies, including the COE, these impacts have been assessed in this Draft EIS.

Two alternatives for the rebuilding and reconstruction of DM&E's existing system are assessed in this Draft EIS. The first alternative considered, the No-Action Alternative, would result if the Board denied DM&E's Application to construct and operate a new rail line extension into the Powder River Basin to transport coal. Under this alternative, DM&E could still undertake rehabilitation and reconstruction of its existing rail line. However, no new construction outside of existing rail right-of-way would be approved by the Board, and no new rail line into the Powder River Basin would be constructed. DM&E has stated that the rail line expansion is necessary to allow it to rebuild its existing system. DM&E further stated that it is unlikely that it could undertake the overall rehabilitation of its existing rail line without the expansion into the Powder River Basin. Moreover, as noted above and in the Board's decision issued December 10, 1998, that without rebuilding its existing rail line, the current service DM&E offers to its shippers would probably cease or continue to deteriorate.

The second alternative, designated in this section as the Action Alternative, would involve the total reconstruction and rehabilitation of DM&E's existing rail line across southern Minnesota and central South Dakota. The Action Alternative would result if the Board grants DM&E final authority to construct and operate a new rail line extension into the Powder River Basin and DM&E rebuilds its existing rail line to transport unit coal trains safely, reliably, and efficiently. Because DM&E states that the rehabilitation of its existing system depends on approval of the new rail line expansion into the Powder River Basin, the Board's approval of DM&E's proposed rail line extension likely would be necessary before reconstruction of the existing rail line would take place, despite the fact that no approval from the Board is required for this rehabilitation activity.¹³

In these circumstances, the No-Action Alternative would not allow DM&E to satisfy any of its identified purposes and needs for this project. Under the No-Action Alternative, DM&E would not construct new rail line into the Powder River Basin, providing additional competition for transport of the region's coal. Moreover, since DM&E has stated it requires the revenue it would gain from a new line into the Powder River Basin to make it financially viable, DM&E likely also would not rehabilitate its existing system to provide improved and continued rail

¹³ Permits would still be required by other agencies, including the COE.

service to its existing shippers if the proposed expansion is denied. An upgraded, rehabilitated rail line could result in substantial safety benefits to DM&E's existing rail operations, and could, in turn, enhance safety in the communities and surrounding rural areas through which DM&E operates.

The proposed increased rail operations — specifically, the maximum of 34 unit coal trains — could potentially erode somewhat from the substantial safety improvements that could occur from a totally upgraded DM&E rail line through Minnesota and eastern South Dakota. Some of these potential safety impacts, however, could be mitigated (see Chapter 7). On balance, therefore SEA considers the Action Alternative — rehabilitation of the existing rail line — to be the environmentally preferred alternative.

6.4 MANKATO AND OWATONNA ALTERNATIVES

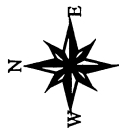
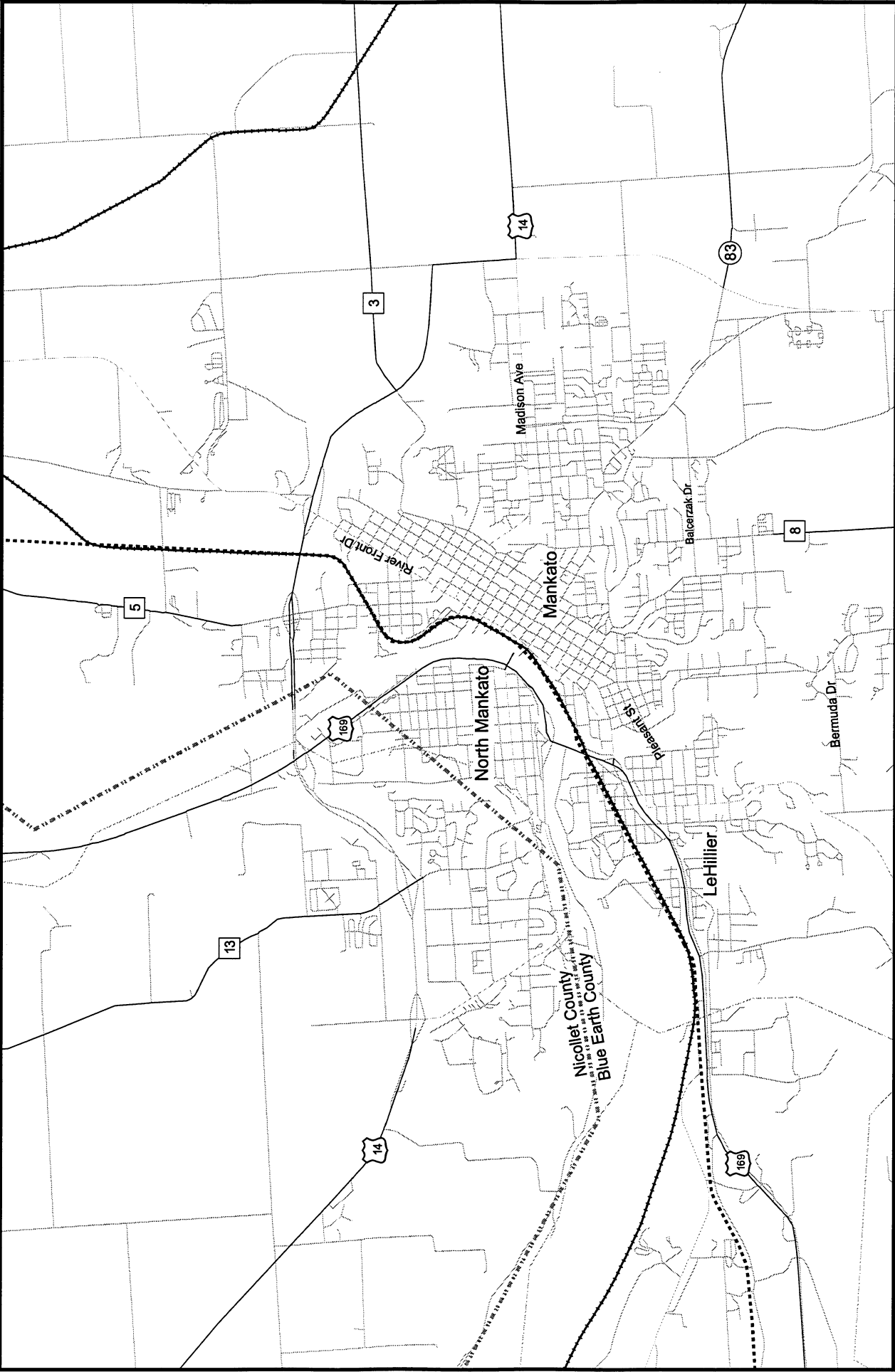
Even though this portion of the project deals with the rehabilitation of existing rail line, some new construction, as mentioned above, would be necessary in the areas of Mankato, Minnesota and Owatonna, Minnesota. This section discusses alternatives analyzed in Mankato and Owatonna, and identifies the alternatives SEA considers, at this point, to be environmentally preferable.

6.4.1 Mankato

Currently, DM&E's existing system does not include rail line through Mankato (Figure 6-5). As explained in more detail in Chapter 2, DM&E now must operate, via trackage rights, over rail line owned and operated by Union Pacific Railroad Company (UP) for its trains to travel from one side of Mankato to the other. This section of rail line is also currently used by UP for movement of its trains, resulting in operational conflicts that DM&E states reduces the efficiency of its rail operations. Therefore, DM&E considered it necessary to propose its own rail line construction in order to connect its existing track on either side of Mankato.

Three alternatives were considered for the UP bypass component of the proposed project at Mankato. These include the No-Action Alternative, M-1 (extension denial), construction and operation of a 13.3-mile new rail line within new right-of-way around the south side of Mankato (Alternative M-2), and construction and operation of 5.5 miles of new, DM&E-owned and operated rail line within the existing UP rail corridor through the City of Mankato (Alternative M-3).¹⁴ These alternatives are shown in Figure 6-6.

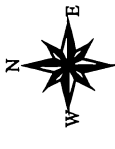
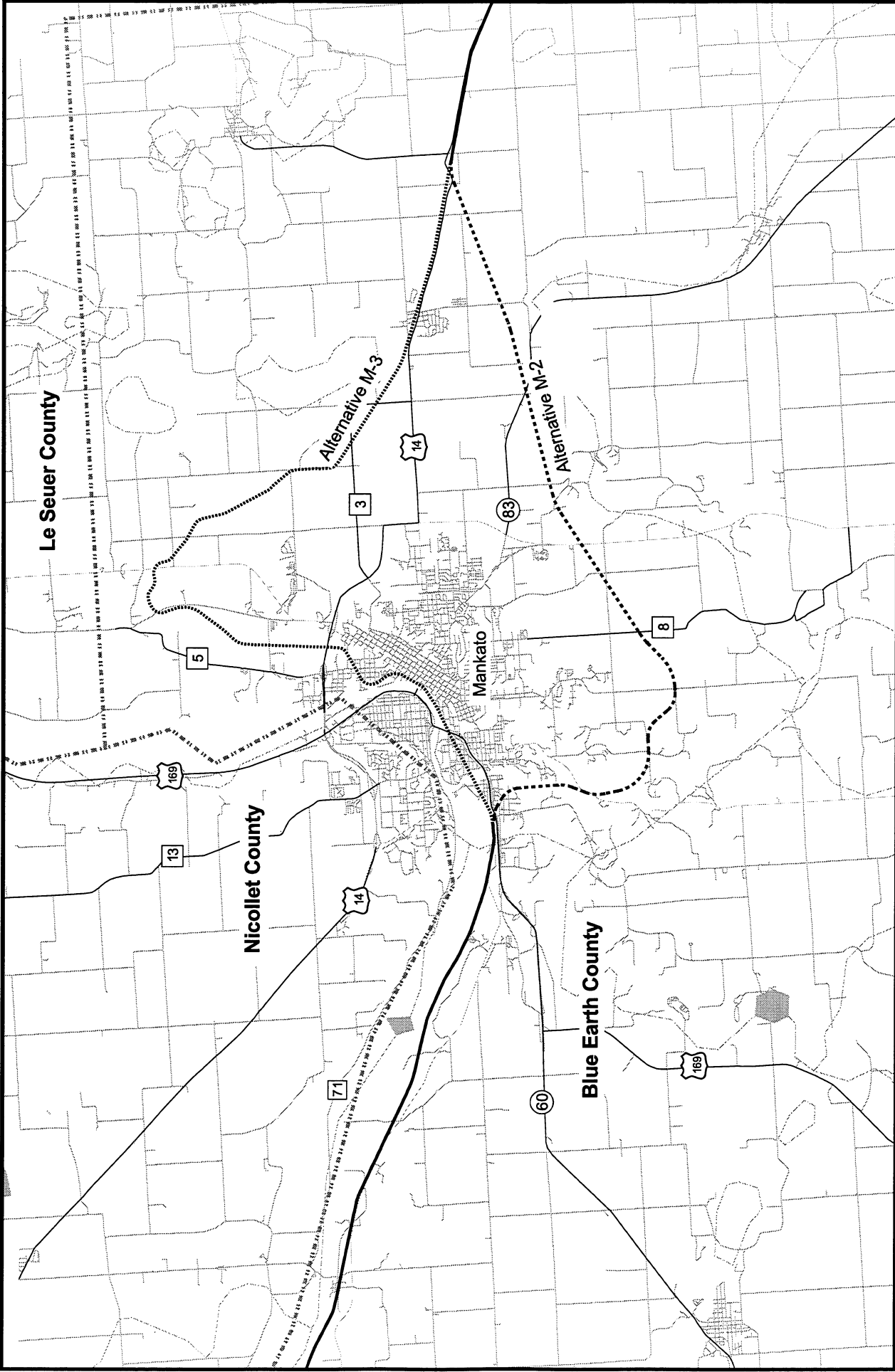
¹⁴ This alternative would also require reconstruction of 10.1 miles of DM&E's existing rail line.



DM&E County Line

Union Pacific Roads

Figure 6-5
POWDER RIVER BASIN EXPANSION PROJECT
Existing Rail Lines
Mankato, Minnesota



- Existing Rail Line
- New Construction
- Streams
- Roads
- County Line
- Existing Rail Line Alternative

Figure 6-6
POWDER RIVER BASIN EXPANSION PROJECT
Mankato Alternatives
Mankato, Minnesota

As discussed in Section 6.2.1.2, selection of the No-Action Alternative would result if the Board denied DM&E the authority to extend its system into the Powder River Basin. Under rail line extension denial, the No-Action Alternative, M-1 — i.e. preserving the status quo in Mankato — would result. Conversely, should the Board grant DM&E authority for the extension, an Action Alternative would be required at Mankato to allow DM&E to avoid operational conflicts with UP and allow efficient movement of DM&E coal trains. The Action Alternatives considered for the connecting track at Mankato include:

- Alternative M-2, the Southern Route.
- Alternative M-3, the Existing Corridor Route.

Because SEA has concluded that rail line extension denial would result in Alternative M-1 and that rail line extension approval would require an action alternative, SEA believes that it would not be appropriate to compare the No-Action Alternative to the two Action Alternatives (see Chapter 2) for selection of a preferred alternative in Mankato. Therefore, SEA has proceeded with analysis for a preferred Action Alternative, recognizing that it likely would only be implemented should the Board approve the rail line extension portion of the project.

SEA has determined that the two Action Alternatives for Mankato would generally have very different impacts. Alternative M-2 would involve construction and operation of new rail line around the south side of Mankato. This alternative would require new right-of-way through generally undeveloped farmland and woodland. Due to its location, Alternative M-2 would have far fewer impacts to human resources (such as noise and safety) than Alternative M-3, except that Alternative M-2 would require removal or relocation of two residences. However, Alternative M-2 would have substantially more impacts to natural resources, such as soils, prime farmland, vegetation, wildlife, and farmland (Table 5.1-8). Although impacts to these resources would be substantial, mitigation could eliminate or minimize many of these effects.

Alternative M-3 would involve construction of new rail line within the existing UP rail corridor through Mankato. The existing rail corridor over which DM&E operates is owned and operated by UP; DM&E operates via a trackage rights agreement with UP. Construction and operation of Alternative M-3 would not only involve construction within this existing rail corridor, but would require modifications to UP's existing rail facilities. Access and permission from UP to undertake these activities would be required. At this time, DM&E does not have permission from UP to construct and operate Alternative M-3.

In contrast to Alternative M-2, Alternative M-3 generally would pass through developed areas, both industrial and residential, along the existing UP rail corridor in the town. Because of this, Alternative M-3 would have little impact on natural resources but would have substantial

impacts to human resources, particularly in the areas of noise and vibration (Table 5.1-8). Moreover, some of the significant impacts to noise sensitive receptors would include environmental justice communities. (Chapter 3 and Table 5.1-8). Also, many of the noise sensitive receptors are already exposed to high levels of noise due to existing UP and DM&E train operations.

Two flood control projects are currently present along the alignment proposed for Alternative M-3. These include earthen levees located immediately adjacent to the existing UP rail line, with the levee on the river-side of the rail line, at Lehillier, Minnesota and a concrete flood wall in downtown Mankato, also immediately adjacent to the UP rail line, with the rail line located on the side of the floodwall away from the Minnesota River. These projects are designed to provide flood protection to the communities of Lehillier and Mankato during high water events in the Minnesota River. Following consultation with the U.S. Army Corps of Engineers (COE), SEA determined that significant impacts to the flood control projects in Lehillier and Mankato could result from construction and operation of Alternative M-3. These impacts would include failure of these structures due to operation of more and heavier trains in closer proximity to the flood levees and walls, particularly during a high water event. Such failure could result in significant damage, and potentially loss of human life, in Mankato. However, consultation with the COE indicates that engineering solutions may be possible to protect flood control projects, even with increased rail operations. However, until DM&E has more than a trackage rights agreement with UP to access UP's right-of-way through Mankato, the information necessary to develop these possible engineering solutions, and their associated costs, is not available.

After full consideration of the Action Alternatives, SEA determined that Alternative M-3 would have significant impacts to noise sensitive and vibration receptors and that significant mitigation measures may be needed to ensure the continued integrity of the local flood projects. Although SEA believes that Alternative M-2 also has substantial impacts, it appears that, based on currently available information, these potential adverse environmental impacts could be effectively mitigated. Therefore, based on the available information, SEA preliminarily concludes that Alternative M-2 appears to be the environmentally preferable alternative (Table 6-7).

At the same time, SEA recognizes that locating additional rail line construction on an existing rail corridor generally is preferable and less impacting to the environment than constructing a new rail line on previously undisturbed land. While Alternative M-3 would have significant impacts within Mankato, SEA understands that DM&E and the City of Mankato have been in the process of negotiating an agreement that contemplates DM&E operating through town, assuming that an agreement can be reached with UP. If a negotiated agreement is reached and submitted to the Board, Alternative M-3 could emerge as the environmentally preferred route.

Table 6-7

**Summary Highlights of Environmental Impacts
Mankato Alternatives**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
M-1	No Build Alternative	Maintain current condition which involves operational inefficiencies due to DM&E operating over another rail carrier (UP)	Noise, Safety	Based on information to-date, Alternative M-2 appears to be environmentally preferred. Should DM&E reach agreement with UP and the City of Mankato and implement measures to ensure safety of flood control projects, Alternative M-3 could become environmentally preferred alternative.
M-2	Southern Mankato Route, provide a connection route south of Mankato.	Bypass DM&E's trackage rights on UP rail line, while avoiding existing rail corridor	Soil, Land Use (Agriculture, Residential), Surface Water, Wetlands, Air Quality, Noise, Vibration, Vegetation, Wildlife, Aquatic Resources and Fisheries, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	
M-3	Existing Corridor Route, provide a connection route within UP's existing rail corridor.	Bypass DM&E's trackage rights on UP rail line by confining rail construction to existing corridor	Land Use (Agriculture, Residential, Business and Industrial), Public Facilities, Public Parks, Surface Water, Wetlands, Flood control projects, Air Quality, Noise, Vibration, Aquatic Resources and Fisheries, Transportation, Safety, Socioeconomics, Recreation	

6.4.2 Owatonna Alternatives

From a rail operating perspective, Owatonna, Minnesota involves issues similar to Mankato. DM&E does not own rail line through Owatonna but operates over UP rail line, via a trackage rights agreement, through town to connect the ends of its existing system on the east and west sides of the town (Figure 6-7). However, unlike Mankato, in Owatonna UP does not operate trains over the section of rail line it owns (the same section which bridges the gap in DM&E's system). Thus, DM&E is able to operate with generally few if any restrictions upon its use of this UP rail line. DM&E, evidently, will continue to be able to do so if this project is approved.

A north-south rail line owned and operated by the I&M Rail Link (I&M) also passes through Owatonna. The I&M rail line comes into Owatonna from the south. Upon reaching the UP line (the rail line over which DM&E currently operates), it turns west and parallels the UP rail line for a short distance. Then the I&M rail line crosses the UP rail line via a diamond switch¹⁵ and continues north. Although UP does not operate any trains over, or have access to this section of rail line, the trackage rights agreement now in effect between UP and DM&E prohibits DM&E from constructing a connection that would allow DM&E to interchange rail traffic with I&M. DM&E would like the ability to do so if this project is approved.

SEA evaluated five alternatives for construction and operation of a connecting track with I&M at Owatonna. These alternatives include two No-Action Alternatives: extension denial (Alternative O-1); and approval of the rail line extension but denial of authority for an I&M connection (Alternative O-2), allowing DM&E to continue to operate east-west, but not to interchange with I&M at Owatonna under any of the proposed routes.

In addition, SEA considered three action alternatives (Figure 6-8). The O-3 Alternative would be construction and operation of a 3.2-mile new rail line connection track with a "Y" connection to interchange rail traffic with the I&M rail line to allow north-south train movements. The O-4 Alternative involves the same configuration as the O-3 Alternative, but the connection to the I&M would be a shorter, 1.7-mile rail line. The O-3 and O-4 Alternatives would be located just east of Owatonna. Alternative O-5 would be located within Owatonna at the location where the existing UP rail line and the I&M rail line cross. An existing diamond switch at this location, as mentioned above, would be replaced with a "Y" connection to allow train movements from one rail line to another in both directions.

¹⁵ A diamond switch is a type of switch which can be used where two rail lines cross each other. It permits free movement of trains on each rail line through the switch without necessitating that any mechanisms be operated. However, it does not enable trains on one rail line to switch to the other rail line.

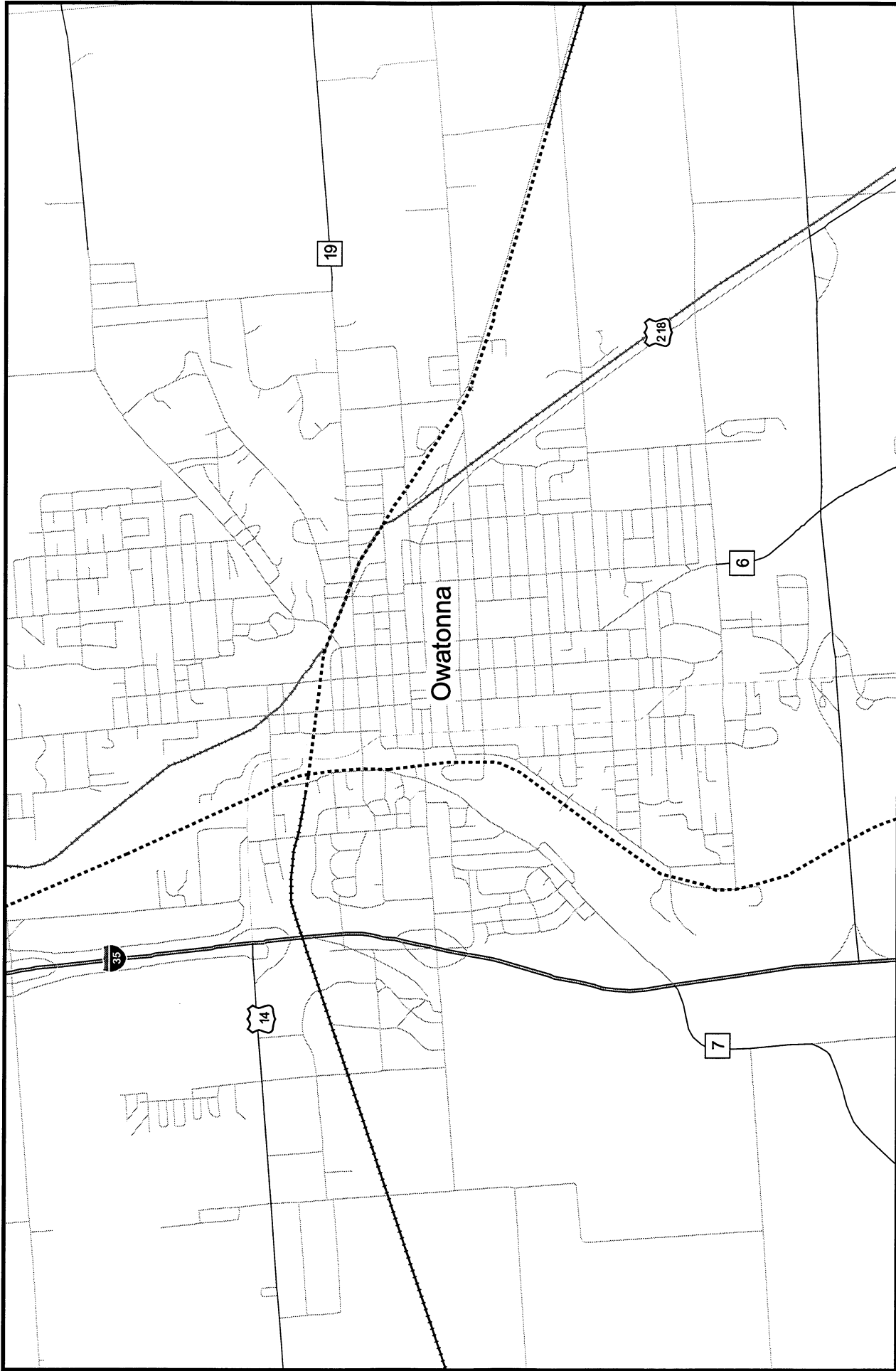
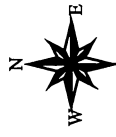
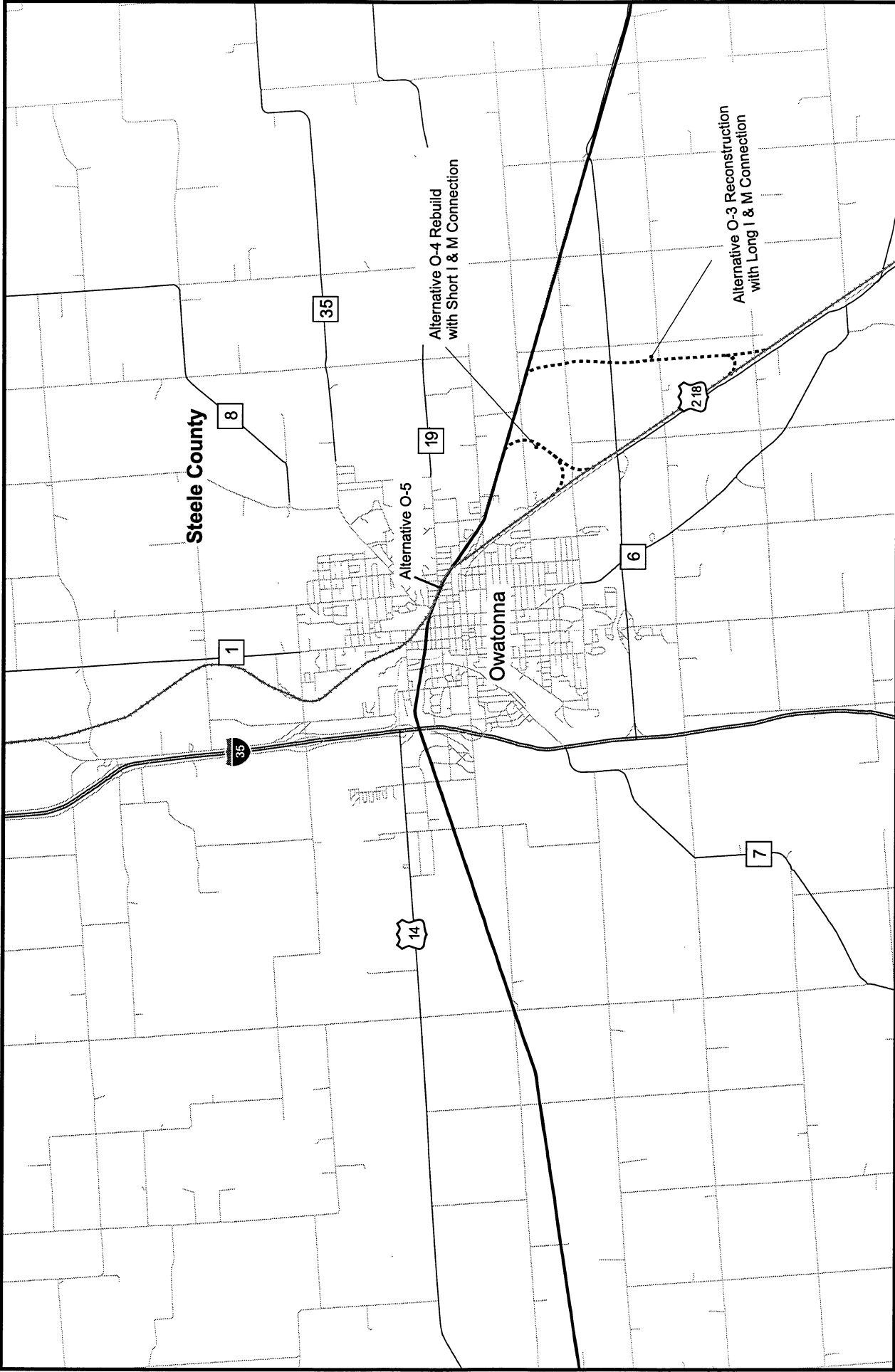


Figure 6-7
POWDER RIVER BASIN EXPANSION PROJECT
 Existing Rail Lines
 Owatonna, Minnesota



2 0 2 Miles

Existing Rail Line

New Construction

Roads

I&M Rail Link

Figure 6-8
POWDER RIVER BASIN EXPANSION PROJECT
Owatonna Alternatives
Owatonna, Minnesota

As discussed in Section 6.2.1.2, the O-1 No-Action Alternative would result if the Board denies DM&E authority to extend its system into the Powder River Basin. Conversely, if the Board grants DM&E authority for the rail line extension, some other alternative would be required at Owatonna to provide for movement of north-south coal trains. Therefore, SEA saw no reason to compare Alternative O-1, to the other Owatonna Alternatives to select a preferred alternative. Instead, SEA has assessed and compared the construction and operation alternatives for Owatonna to determine if one would be environmentally preferable, recognizing that the identified preferred alternative would only be implemented should the Board approve the extension portion of the project.

As discussed in Chapter 3, DM&E has proposed two alternative connections to construct and operate between DM&E and I&M to allow DM&E to interchange rail traffic with I&M. However, it is impossible to predict exactly how the rail traffic would move through Owatonna or how much traffic there would be because no contracts for shipment of coal over DM&E and I&M are currently in-place. Should coal trains begin moving, DM&E would need approval to build one of these connections to move over I&M. In these circumstances, SEA has conservatively assumed that all future coal traffic would pass directly through Owatonna on the UP rail line, even though some of the trains would be leaving the DM&E rail line to move north or south over the I&M.

Of the alternatives SEA considered, only Alternatives O-3, O-4, and O-5 would allow for interchange between DM&E and I&M. Alternatives O-2 and O-5 would not require acquisition and construction of rail line in new right-of-way (because the existing UP rail line would be used).

Alternatives O-2 and O-5, therefore, are assumed to have the same impacts as both would involve reconstruction of existing rail facilities within existing rail line right-of-way and have the same levels of rail traffic (albeit different traffic patterns). However only Alternative O-5 would allow for rail traffic interchange between DM&E and I&M. Alternatives O-3 and O-4 would include new construction and operation of short sections of rail line to connect DM&E and I&M. The impact from these two alternatives would differ from those associated with Alternatives O-2 and O-5. Because the purpose of this project component is to provide for interchange between DM&E and I&M, SEA has determined that Alternative O-2 would not meet the project's purpose and need (see Chapter 1).

In comparing the three remaining Action Alternatives for Owatonna, O-3, O-4, and O-5, SEA preliminarily has determined that, with appropriate mitigation, all of these alternatives would not have significant environmental impacts other than noise. At the same time, SEA recognizes that the noise impacts to noise sensitive receptors generally would be similar for each of these

alternatives (Table 5.1-9); therefore, potential noise impacts do not provide a basis to distinguish between the alternatives.

After considering the potential impacts of these Owatonna alternatives, SEA preliminarily concludes that Alternative O-5 appears to be the environmentally preferable alternative (even though it could not be implemented without a way for DM&E to connect with I&M). Alternative O-5 would meet the purpose and need for the project, would not require any additional right-of-way, and would have generally minimal impacts to environmental resources (Table 6-8).

Assuming that the legal barrier to Alternative O-5 is not removed, SEA believes that Alternative O-4 would be more environmentally preferred than Alternative O-3, the only other remaining construction alternative in Owatonna. Alternative O-4 would have essentially the same impacts as Alternative O-3, while still providing the rail line interchange that DM&E desires. However, Alternative O-4, which is shorter, would involve less new rail line construction than Alternative O-3, resulting in less ground disturbance, less land converted to rail line right-of-way, less loss of prime farmland, disturbance to fewer farming operations and rural residences, less locomotive emissions, and one less grade crossing of a roadway.

6.5 PROPOSED COMMUNITY BYPASSES

On January 6, 1999, the City of Rochester, Minnesota requested that SEA consider a south bypass corridor as an alternative to DM&E's proposed plan to rehabilitate its existing rail line and operate additional rail traffic, primarily coal trains, through Rochester. In the Final Scope issued March 1999, SEA provided a 30-day comment period for interested parties to submit comments on the Rochester Bypass. SEA subsequently issued a Notice to the Parties on April 20, 1999, providing an opportunity for other interested communities to develop bypass proposals.

In the Notice to the Parties, SEA noted that it would determine whether each bypass proposal submitted constituted a reasonable and feasible alternative to DM&E's plan to upgrade its existing route, or would simply shift the potential environmental consequences of DM&E's proposal to different communities and populations. Moreover, SEA stated that in deciding whether bypass proposals were reasonable and feasible, it would take into account DM&E's goal of creating a more efficient route by which to transport coal. SEA noted that "a circuitous route that bypasses numerous communities could add so many additional miles that it would be unlikely to allow the Applicant to achieve its goal of providing efficient rail transportation" (see Notice to the Parties, at page 2, Appendix A).

Table 6-8
Summary Highlights of Environmental Impacts
Owatonna Alternatives

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
O-1	No action alternative, DM&E would be unable to interchange rail traffic with I&M, existing rail line would not be reconstructed	Maintain environmental status quo, DM&E rail interchange would be limited to existing locations	Noise, Vibration, Transportation, Safety	Assuming DM&E could implement Alternative O-5, SEA preliminarily concludes that Alternative O-5 appears to be the environmentally preferable alternative because it would not require any additional right-of-way and would have generally minimal environmental impacts. If Alternative O-5 could not be implemented, SEA believes Alternative O-4 would be the environmentally preferable alternative because it would have less environmental impacts and minimize new rail line construction.
O-2	Reconstruction of existing rail line, but no interchange with I&M	Improve rail operations through Owatonna, DM&E rail interchange would be limited to existing locations	Land Use (Residential, Business and Industrial), Wetlands, Air Quality, Noise, Vibration, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Senic Values	
O-3	Reconstruction of existing rail line and construction of 3.2-mile rail line connection with I&M	Enable rail interchange between DM&E and I&M using connecting track long enough to accommodate an entire train	Soils, Land Use (Agriculture, Residential, Business and Industrial), Wetlands, Air Quality, Noise, Vibration, Vegetation, Wildlife, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Senic Values	

Table 6-8
Summary Highlights of Environmental Impacts
Owatonna Alternatives

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
O-4	Reconstruction of existing rail line and construction of 1.7-mile rail line connection with I&M	Enable rail interchange between DM&E and I&M, minimizing new rail line construction	Soils, Land Use (Agriculture, Residential, Business and Industrial), Wetlands, Air Quality, Noise, Vibration, Vegetation, Wildlife, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Senic Values	
O-5	Reconstruction of existing rail line and construction of rail connection with I&M within existing rail line right-of-way of another rail carrier (UP)	Enable rail interchange between DM&E and I&M minimizing new rail line construction and confining construction to existing rail right-of-way	Land Use (Residential, Business and Industrial), Wetlands, Air Quality, Noise, Vibration, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Senic Values	

In response to the Notice to the Parties, three communities (in addition to Rochester), submitted bypass designs to SEA: Owatonna, Minnesota; Brookings, South Dakota; and Pierre, South Dakota. As part of its preparation of this Draft EIS, SEA assessed each of these bypass proposals and determined that three of the bypasses were reasonable and feasible alternatives, and therefore, should be subjected to the same environmental analysis as DM&E's proposal (see Chapter 2 of this Draft EIS). SEA concluded that the Pierre, South Dakota bypass was not reasonable because of significant environmental and engineering constraints; therefore, the Pierre Bypass has been dropped from further consideration. As discussed previously, the City of Owatonna has withdrawn its bypass proposal.

It is important to note that, in making a final determination regarding the two remaining bypass proposals, issues involving the cost of construction and operation of the bypass proposals, and whether to require communities to share these costs, will have to be addressed. In past proceedings, the Board has not required communities to contribute to the funding of environmental mitigation absent a voluntary agreement between the railroad and the community to share costs. Here, however, the sole reason why some communities have proposed a bypass is to move the railroad away from population centers. Moving the rail line would benefit the affected population by reducing residents' exposure to noise, vibration, and traffic delays at grade crossings but the railroad would not benefit, and, indeed could incur substantial additional costs, both related to the initial construction and possibly higher operating costs. Because a bypass would thus benefit the community to the detriment of the railroad, SEA specifically requests comments on the extent to which the benefitting community should contribute to the cost of relocating the railroad, and exactly what portion of that cost the community should bear. SEA further advises the affected communities that, if the Board approves DM&E's proposal and ultimately orders it to build bypasses around the communities of Rochester and/or Brookings, those communities could incur potentially substantial costs associated with the bypasses. SEA's conclusions, based on available information to-date, regarding the Rochester and Brookings bypasses are set forth below.

6.5.1 Rochester Alternatives

DM&E currently owns and operates rail line through the City of Rochester, Minnesota. As noted above and discussed in more detail in Chapter 2, Rochester submitted a proposal for new rail line construction from the existing rail line around the south side of the City. The proposed bypass would enable rail traffic operating through Rochester, particularly unit coal trains, to avoid passing through Rochester and Byron, Minnesota by operating over the bypass. SEA evaluated Rochester's proposal and determined that it warrants consideration as a reasonable and feasible alternative in this Draft EIS.

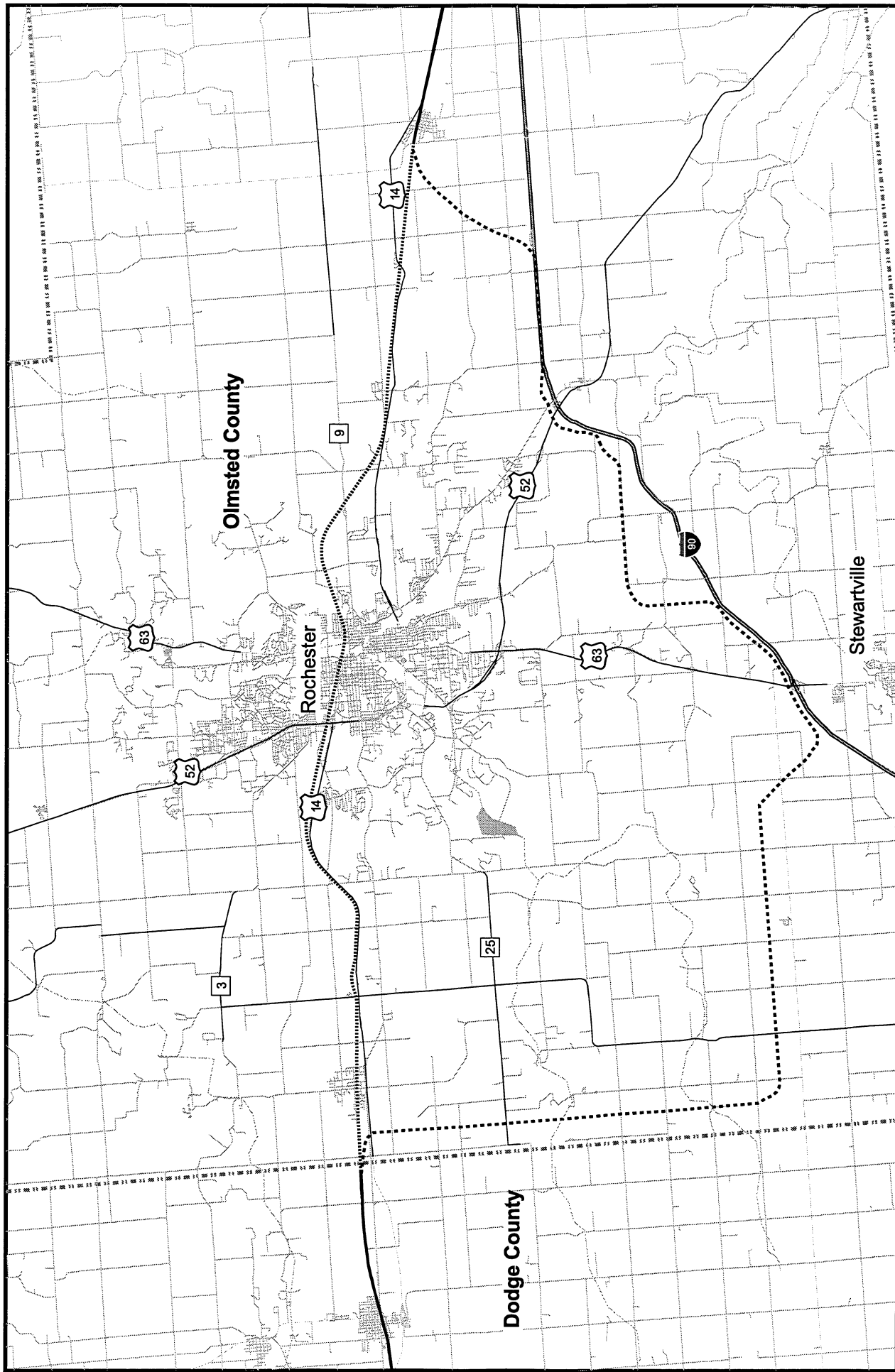
Four alternatives have been considered for the project component involving the community of Rochester. The four alternatives include the No-Action Alternative (extension denial, Alternative R-1), reconstruction of the existing rail line through town (Alternative R-2), construction of a bypass around the south side of town to move future coal traffic (Alternative R-3), and construction of the same bypass south of town for all rail traffic, both future coal and commodities currently moving through Rochester on DM&E's existing system (Alternative R-4).

As discussed in Section 6.2.1.2, the No-Action Alternative would necessarily result if the Board denies DM&E authority to extend its system into the Powder River Basin. Conversely, if the Board grants DM&E authority for the extension, an Action Alternative would be required at Rochester to provide for the movement of unit coal trains. Therefore, SEA has proceeded with analysis for a preferred Action Alternative, recognizing it would only be implemented should the Board approve the extension portion of the project.

The three Action Alternatives for Rochester are significantly different (Figure 6-9). Alternative R-2 involves reconstruction of the existing rail line through Rochester and generally passes through developed areas. Therefore, Alternative R-2 would have little impact on natural resources since the physical area has already been disturbed, but it would have substantial impacts to human resources, particularly from noise and vibration (see Chapter 3, and Table 5.1-11). Additionally, Alternative R-2 likely would have impacts on the movement of emergency vehicles in Rochester due to the location of the Mayo Clinic, a large medical complex in the town, and certain of the Mayo Clinic's facilities in close proximity to the existing rail line. Moreover, because the size and nature of the Mayo Clinic's operations and its proximity to the existing rail line, a large number of emergency vehicles would be required to cross the rail line as they go to and from that facility.

Additionally, Alternative R-2 would have significant impacts to residential land use and noise because a large number of residences within close proximity to the rail line would be exposed to increased noise levels along the rail line. Some of these noise sensitive receptors are in environmental justice communities. SEA has determined that environmental justice communities in six census block groups would potentially experience disproportionately high and adverse impacts from increased noise.

In contrast to Alternative R-2, Alternatives R-3 and R-4 (the bypass alternatives) would involve construction and operation of new rail line around the south side of Rochester. This new rail line would require new right-of-way through generally undeveloped farmland. Due to their location through rural, undeveloped areas, Alternatives R-3 and R-4 would have far fewer impacts to human resources than Alternative R-2. However, these alternatives would have substantially more impacts to natural resources, such as soils, vegetation, wildlife, wetlands, and



- Existing Rail Line
- New Construction
- Streams
- Roads
- County Line
- Existing Rail Line Alternative

Figure 6-9
POWDER RIVER BASIN EXPANSION PROJECT
Rochester Bypass Alternative Route
Rochester, Minnesota

farmland (Table 5.1-11). In particular, Alternatives R-3 and R-4 would convert 53.2 acres of wetland, including 9.5 acres of forested wetlands to rail line right-of-way. Additionally, the area where the bypasses would be built has a potential to contain calcareous fens, a rare and sensitive type of wetland considered of high value and afforded special protection in Minnesota. Approximately 2.1 miles of the right-of-way under the bypass alternative would also cross areas of karst topography,¹⁶ 3.7 miles have a moderate to high potential for containing karst areas. Prior to construction, these areas would require extensive geological investigations to identify sinkholes, underground caverns, and other hazards, as well as implementation of extensive and expensive measures to insure safe construction and operation of a rail line through this area. Even with these measures, new sink holes and caverns could develop under the rail line, making it difficult to insure the safety of the rail line over the entire life of the project.

The additional length of the two bypass alternatives, approximately 10.8 miles more than Alternative R-2, would also result in increased fuel consumption and associated locomotive emissions. Alternatives R-3 and R-4 would add 34 grade crossings, although all were calculated to have accident frequencies below SEA's level of significance. Moreover, under the bypass alternatives, the existing DM&E rail line through Rochester would not be reconstructed. Therefore, through trains (Alternative R-3) or trains accessing local shippers (Alternatives R-3 and R-4) would be required to operate over the deteriorated rail line, reducing the overall efficiency of the remainder of the rail line. The reduction in efficiency would only affect train movements for the short period they would be required to operate over this (relatively short) portion of the rail line; reconstruction of other portions of the existing line would likely lead to better overall service. However, if weight restrictions on the existing rail line in Rochester prevent Rochester shippers from using rail cars loaded to industry standards (as discussed in Chapter 1), the benefits to these shippers from reconstruction of other portions of the rail line would be minimized.

Based on the information available to-date, SEA preliminarily concludes that Alternative R-2 potentially would have significant impacts to land use and noise sensitive and vibration receptors located in the City, including certain facilities at the Mayo Clinic, located a few blocks from DM&E's existing rail line (Table 6-9) and the Federal Medical Center. Moreover, noise impacts of the magnitude at issue here would be difficult to mitigate, and there would be impacts on transportation and safety, i.e., emergency vehicle movements. The bypass alternatives, Alternatives R-3 and R-4, however, also would have substantial impacts to a variety of resources,

¹⁶ Karst topography refers, in this case, to underground areas where groundwater dissolves away the bedrock, creating spaces, tunnels, or holes within the bedrock, commonly known as underground caverns, sinkholes, or caves. These openings are subject to collapse as the bedrock dissolves away and can no longer support the weight of overlying material or structures.

Table 6-9

**Summary Highlights of Environmental Impacts
Rochester Alternatives**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
R-1	No action alternative, existing rail line not reconstructed	To maintain the environmental status quo, rail operations in Rochester remain unchanged	Safety, Transportation, Socioeconomics	SEA believes use of existing rail corridor is generally environmentally preferable to new rail line construction. However, the reconstruction and bypass alternatives would both have significant although different environmental impacts. Therefore, SEA requests further comments on which alternative would be environmentally preferable and the extent to which the community should share the cost of a bypass, if one is approved.
R-2	Reconstruction of existing rail line through Rochester	Improve rail service and operation through Rochester	Land Use (Residential, Business and Industrial), Public Facilities (Mayo Clinic), Surface Water, Wetlands, Air Quality, Noise, Vibration, Transportation (emergency vehicles), Safety, Cultural Resources, Socioeconomics	
R-3	Construction of new rail line by-pass around the South side of Rochester, no change in rail line or operations in Rochester	Minimize environmental impacts from increased rail traffic by routing it around Rochester	Geologic Hazards, Soils, Land Use (Agriculture, Residential), Surface Water, Wetlands, Groundwater, Air Quality, Noise, Vibration, Vegetation, Wildlife, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	

Table 6-9

**Summary Highlights of Environmental Impacts
Rochester Alternatives**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
R-4	Construction of a new rail line by-pass for all rail traffic around the south side of Rochester	Minimize environmental impacts by rerouting new and existing rail traffic around Rochester	Geologic Hazards, Soils, Land Use (Agriculture, Residential), Surface Water, Wetlands, Groundwater, Air Quality, Noise, Vibration, Vegetation, Wildlife, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	

including soils, farmland, geology, wetlands, vegetation, and wildlife. Some of these impacts could be minimized through mitigation, although they could not be completely avoided.

One of the stated purposes of DM&E's proposal is to provide improved rail service to existing shippers. Construction and operation of either of the bypass alternatives would not improve service or access to existing shippers on the existing DM&E rail line in Rochester, although reconstruction of other portions of the existing line would likely lead to better overall service. However, if weight restrictions on the existing rail line prevent the use of rail cars loaded to industry standards (as discussed in Chapter 1), the benefits to Rochester shippers of reconstruction of other portions of the rail line would be minimized. Thus, while from an environmental impact standpoint, the bypass alternatives appear to minimize overall impact to the human environment, they may not contribute to the overall purpose and need defined for the project.

In general, use of existing rail corridors is generally environmentally preferable to construction of new rail line on undisturbed land. Here, however, both reconstruction and operation of the existing rail line and construction and operation of new rail line would have substantial, though different, adverse environmental impacts: impacts along the existing rail line would be primarily to human resources and could be difficult to mitigate; impacts along the new rail line would be primarily to natural resources and mitigation measures would likely be more successful in reducing impacts, although at a significant financial cost. In addition, bypass alternatives may not contribute to the overall project purpose. Given the various environmental impacts associated with the various Rochester options, SEA specifically requests comments on these alternatives.

In these circumstances, SEA requests further comments on which alternatives are environmentally preferable and proposals for how to share costs of the proposed bypass. SEA will respond to the comments and, if appropriate, identify an environmentally preferable alternative for the City of Rochester in the Final EIS.

6.5.2 Brookings Alternatives

SEA has considered four alternatives for the project in the community of Brookings. These include the No-Action Alternative (B-1), reconstruction of the existing rail line through town (Alternative B-2), construction of a bypass around the north side of town for future coal traffic (Alternative B-3), and construction of a bypass north of town for all rail traffic (Alternative B-4). As discussed in Section 6.2.1.2, selection of the No-Action Alternative would result if the Board denies DM&E authority to extend its system into the Powder River Basin. Thus, the No-Action Alternative in Brookings would result from the Board's decision on the rail line extension

request. On the other hand, if the Board grants DM&E authority for the extension, an Action Alternative would be required at Brookings to provide for movement of coal trains. Therefore, SEA has proceeded with analysis for a preferred Action Alternative, recognizing it would only be implemented should the Board approve the extension portion of the project.

The three Action Alternatives for Brookings (Figure 6-10) have important differences. Alternative B-2, which involves reconstruction of the existing rail line, generally passes through developed areas along the rail line and would involve existing rail line right-of-way. Consequently, Alternative B-2 would have little impact on natural resources but would have substantial impacts to noise and vibration and residential land use because of the number of noise sensitive receptors exposed to increased noise levels along the rail line (see Chapter 4 and Table 5.1-11). Some noise sensitive receptors would be within environmental justice communities. SEA identified environmental justice communities in eight census block groups that would potentially experience disproportionately high and adverse impacts from noise increases.

Alternative B-2 could also have potentially substantial impacts to wetlands, based on review of National Wetland Inventory (NWI) maps. Although many of the wetlands along Alternative B-2 could have been created from lack of drainage along the existing rail bed and could be of low quality and functional value, nonetheless, they would require both a permit and mitigation for impacts by the COE under the Clean Water Act.

Alternatives B-3 and B-4, the bypass alternatives, would involve construction and operation of new rail line around the north side of Brookings. This rail line would require new right-of-way through generally undeveloped farmland. Due to their location, Alternatives B-3 and B-4 would have far fewer impacts to human resources than Alternative B-2, and by routing trains away from town, would reduce impacts to noise sensitive receptors affected by train noise. However, these alternatives would have substantially more impacts to natural resources, such as soils, vegetation, wildlife, and farmland. Alternatives B-3 and B-4 would also result in a substantial amount of wetland loss (approximately 18.9 acres), most of which would likely be considered to be of a high quality (compared to approximately 30.5 acres for Alternative B-2, most of which would be of a low quality but would still require permitting and mitigation). The additional length of the bypass alternatives, approximately 1.2 miles more than Alternative B-2, would result in increased fuel consumption and associated locomotive emissions. Alternative B-4 was also calculated by SEA to cause significant increases in accident frequency at up to 5 road crossings under the 100 million-ton operating level due to the numbers and speeds of trains at this level of operations.

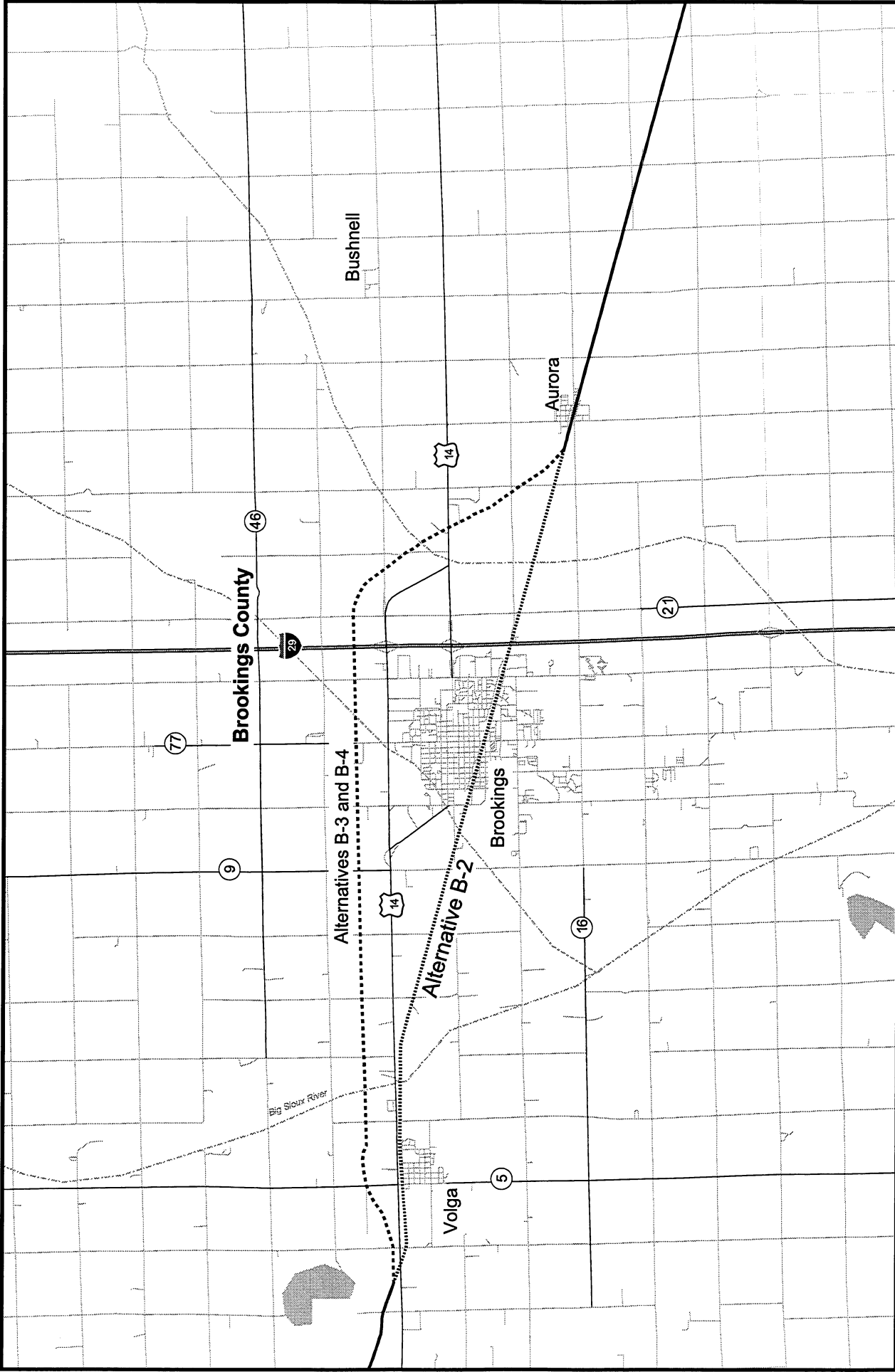


Figure 6-10
POWDER RIVER BASIN EXPANSION PROJECT
 Brookings Bypass Alternative Route
 Brookings, South Dakota

DM&E has indicated that construction of either of the bypass alternatives would reduce rail access to an existing shipper north of Brookings by requiring complicated movements of locomotives and rail car sets to provide safe service to this shipper (Chapter 4). Also, under the bypass alternatives, the existing DM&E rail line through Brookings would not be reconstructed. Through trains or trains accessing local shippers would be required to operate over the deteriorated rail line, reducing the overall efficiency of the remainder of the rail line. SEA does not believe that this reduction would be significant because it would only affect train movements over the relatively small amount of track on this portion of the rail line. Additionally, the bypass alternatives would require construction of a new grade-separated rail bridge where they would cross Interstate 29 (I-29). During bridge construction, traffic delays on the interstate could be expected.

Based on the available information, SEA concludes that Alternative B-2 would have significant impacts to noise sensitive and vibration receptors that would be difficult to mitigate effectively. Other impacts, though substantial for some resources, such as soils, wetlands, and residential land use, could be more effectively mitigated. The bypass alternatives would also have substantial impacts; however, SEA believes these impacts could be adequately mitigated if the mitigation SEA recommends is imposed and implemented.

Based on the differences in potential environmental impacts, SEA preliminarily concludes that the bypass alternatives would appear to be preferred, with Alternative B-4 being preferred overall due to its reduction in noise levels to noise sensitive receptors (Table 6-10). However, as discussed above, one of the stated purposes of this project is to provide improved rail service to existing shippers. Construction and operation of either of the bypass alternatives would not improve service or access to existing shippers on the existing DM&E rail line in Brookings, although reconstruction of other portions of the existing line would likely lead to better overall service. Moreover, if weight restrictions on the existing rail line prevent the use of rail cars loaded to industry standards (as discussed in Chapter 1), the benefits to Brookings shippers of reconstruction of other portions of the rail line would be minimized. Additionally, construction and operation of the bypass alternatives would reduce access to an existing shipper and potentially require additional rail construction to provide for reasonable access to the shippers facility, require the shipper to relocate, or require the shipper to convert from rail to truck for its transportation needs. Thus, while from an environmental impact standpoint, the bypass alternatives appear preferable, they may not contribute to the overall purpose and need defined for the project. SEA specifically requests further comments on the Brookings alternatives and on whether and how to allocate mitigation costs. SEA will address the comments received in the Final EIS.

Table 6-10

**Summary Highlights of Environmental Impacts
Brookings Alternatives**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
B-1	No-Action Alternative, existing rail line not reconstructed	To maintain the environmental status quo, rail operations in Brookings would remain unchanged	Transportation, safety	Based on the differences in the potential environmental impacts, SEA preliminarily concludes that Alternative B-4 appears to be the environmentally preferred alternative. However, because this alternative may not contribute to the overall purpose and need defined for the project because it would not improve rail service to Brookings shippers, SEA specifically requests further comments on the Brookings alternatives, including the extent to which the community should share the cost of a bypass, if one is approved.
B-2	Reconstruction of existing rail line through Brookings	Improve rail service and operation through Brookings	Land Use (Residential, Business and Industrial), Wetlands, Air Quality, Noise, Vibration, Wildlife, Transportation, Safety, Socioeconomics, Recreation,	

Table 6-10

**Summary Highlights of Environmental Impacts
Brookings Alternatives**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
B-3	Construction of new rail line bypass around the north side of Brookings, no change in rail line or operations in Brookings	Minimize environmental impacts from increased rail traffic by routing it around Brookings	Soils, Land Use (Agriculture), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	
B-4	Construction of a new rail line bypass for all rail traffic around the north side of Brookings	Minimize environmental impacts by rerouting new and existing rail traffic around Brookings	Soils,, Land Use (Agriculture), Surface Water, Wetlands, Air Quality, Vegetation, Wildlife, Transportation, Safety, Cultural Resources, Socioeconomics, Recreation, Viewsheds/Scenic Values	

6.6 RAIL YARDS

Numerous new rail yards have been proposed as part of the PRB Expansion Project. The six major yards, discussed and analyzed previously in this Draft EIS, would be designed to perform multiple functions, including crew change locations, inspections, dispatch and interchange, fueling, and maintenance.¹⁷ Having individual yards perform multiple functions would limit the number of facilities required for operation, as well as the impacts that would be associated with construction and operation of these additional facilities, while still enabling the railroad to operate efficiently. The location of each yard would be dependent largely on the location of other yards along the DM&E system. Specifically, the location of a yard needed to provide for interchange of trains with another rail carrier on the eastern end of the system and the yard for dispatch of trains to and from the mines on the western end of the system affect the locations of the intermediate yards.

DM&E stated that the distance and transit times between the yards was the primary factor in yard location. As discussed in Chapter 2, yards need to be located a sufficient distance to provide for crew changes, inspections, and maintenance functions, many of which are dependent on travel time, fueling considerations, and/or distance. Therefore, in the operating plan developed by DM&E for this project, discussed in Chapter 1, DM&E indicated that it would locate its new yards approximately 225 to 275 miles apart. Shifting a yard one way or the other makes it closer to one yard and further from the others, potentially affecting the location of the other yards. Because of the influence of distance on yard placement and the differences in distance between the Extension Alternatives, potential yard locations throughout the system vary somewhat for each Extension Alternative. Moreover, locations for yards for one alternative may not be the same for a different alternative. Accordingly the yards that actually would be constructed would depend on what Extension Alternative, if any, the Board ultimately approves.¹⁸ And with the two exceptions discussed below, there are no real alternatives to the various yards that would be built under Alternatives B and C. There are no real alternatives to the various yards that have been proposed and studied. The two exceptions are: the Middle East Staging and Marshalling Yard and the West Staging and Marshalling Yard where two alternative sites have been proposed. The following provides SEA's determinations on which yard site would be preferable.

¹⁷ Normally, railroads do not need authority from the Board to construct rail yards or other facilities that are ancillary to a railroad's operations. However, because the yards at issue here would not be built but for this extension project, SEA has considered the yards in its environmental review.

¹⁸ SEA examined the environmental effects of the yards that would be associated with Alternative D as well, but Alternative D has been eliminated from further consideration, as discussed above.

6.6.1 Middle East Staging and Marshalling Yard

The Middle East Staging and Marshalling Yard (Middle East Yard) would be located so as to facilitate rail interchange between DM&E and UP by operating in conjunction with UP's rail yard just north of Mankato, Minnesota. The Middle East Yard would allow for storage of train cars until picked up by UP. The alternative yard sites, Option A and Option B, would be located approximately 10 miles apart. Chapter 3 provides a discussion of the proposed yard locations and the potential environmental impacts associated with their construction and operation. Table 5.1-12 provides a summary of the potential impacts associated with construction and operation of the two alternative locations for this yard.

In assessing the two options, SEA determined that the Option A yard location would have greater impacts to state lands than Option B. Option A would require DM&E to acquire approximately 116.4 acres of land within the boundaries of Minneopa State Park. This land is not currently part of the park but has been identified for acquisition by the State, should it become available, to expand Minneopa State Park. DM&E currently operates rail line through this area and, if the proposed project is approved, would continue to do so regardless of train traffic in the Mankato area. Option B would not require acquisition of any lands within the park's boundaries. Option B for the Middle East Yard would result in the loss of approximately 109.4 acres of prime farmland, verses no such loss for Option A, and 14.2 acres of wetlands, verses 3.7 acres for Option A. Option B, since it would be further from Mankato, would require DM&E to travel greater distances, increasing fuel consumption and travel time.

After considering the potential construction and operational impacts of the yard Options, SEA determined impacts to the Minneopa State Park to be extremely significant. Minneopa State Park is an important public resource for the citizens in and around Mankato. SEA, therefore determined Option B would be the environmental preferable location for the Middle East Yard (Table 6-11). In reaching this conclusion, SEA recognized that Option B would affect more prime farmland and wetlands. However, prime farmland is abundant throughout southern Minnesota, and the loss of prime farmland from construction of Option B would amount to a relatively insignificant reduction in Brown County, where over 314,000 acres, approximately 82 percent of the land is prime farmland (Table 3.1-4). Additionally, approximately 9.5 more acres of wetlands would be lost with Option B. However, any losses of wetlands could be mitigated to some extent by required permitting under Section 404 of the Clean Water Act. Lastly, DM&E did not indicate Option B would create any significant operational difficulties.

Table 6-11

**Summary Highlights of Environmental Impacts
Middle East Staging and Marshaling Yard**

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Option A	Construction and operation of new rail yard west of Mankato, Minnesota	Provide facilities for train crew changes and efficient interchange of rail traffic with UP	Soils, Land Use (agricultural), State lands, surface water, wetlands, air quality, noise, vegetation, transportation, socioeconomic	After considering the potential environmental impacts of the yard options, SEA determined impacts to Minnesota State Park to be significant and difficult to mitigate. Other environmental impacts could be mitigated. Therefore, SEA preliminarily concludes that Option B would be the environmentally preferable alternative.
Option B	Construction and operation of new rail yard east of New Ulm, Minnesota	Provide facilities for train crew changes and efficient interchange of rail traffic with UP, while avoiding State Park lands	Soils, Land Use (agricultural), wetlands, air quality, noise, vegetation, transportation, socioeconomic	

6.6.2 West Staging and Marshalling Yard

The West Staging and Marshalling Yard (West Yard) has two proposed locations, both on the western end of the Extension Alternatives straddling the Weston/Campbell County line in Wyoming, that could be used should DM&E be granted authority to construct and operate Alternative C. This yard would primarily function as a staging and dispatch location for empty trains traveling to the mines to be loaded and for loaded coal trains to await dispatch eastward. The two alternative sites for the West Yard, Option A and Option B, are located at the same point along Alternative C. However, Option B would be slightly south of Option A. Chapter 4 provides a discussion of the proposed yard locations and the potential impacts associated with their construction and operation. Table 5.1-14 provides a summary of the potential impacts associated with construction and operation of the two alternative locations for this yard.

Because West Yard Option A and Option B are located in generally the same area, their impacts are essentially the same. No operational differences between the options have been identified by DM&E.

However, SEA identified two areas where the yard options differed in potential environmental impacts. These impact areas included conversion of public lands and water resources. Option A would require conversion of approximately 71.0 acres of Thunder Basin National Grassland (TBNG) and 78.0 acres of State of Wyoming land to railroad right-of-way, for a total impact of 149.0 acres. Additionally, the USFS has indicated construction and operation of a rail yard on this small parcel of TBNG would affect the remainder of the parcel by making it no longer desirable as a part of TBNG. This land would also, in practicality, no longer be available for public use, including livestock grazing, for which it is currently used. Option B would not affect any lands of TBNG and would require conversion of 45.0 acres of State of Wyoming land.

The second area of difference between the options would be to water resources. Option A would cross 21 intermittent streams, Option B only 6. Additionally, nearly the entire northern border of the Option A yard would be within 500 feet of Little Thunder Creek. Option B would be approximately twice as far, 1,000 feet, away from Little Thunder Creek.

Based on the information available to date, SEA considers Option B for the West Yard to be environmental preferable due to this location having less impact on public lands, particularly those lands part of TBNG (Table 6-12). Moreover, the USFS has indicated to SEA that it would require a land exchange, whereby DM&E would exchange land elsewhere for the USFS lands at the Option A site before the USFS would agree to Option A. In that event, SEA would reconsider which yard alternative would be preferable.

Table 6-12
Summary Highlights of Environmental Impacts
West Staging and Marshaling Yards

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Option A	Construction and operation of a new rail yard on the Campbell/Weston County line, Wyoming	Provide facilities for train staging and dispatch westward to the coal mines and eastward to coal users	Soils, Land Use (grazing/ranching), National Grasslands, State lands, surface water, air quality, vegetation, wildlife, socioeconomics, cultural resources	Based on the information available to date, SEA considers Option B to be environmentally preferable due to it having less impact on public lands, particularly Thunder Basin National Grassland. In the event DM&E would exchange land elsewhere for National Grasslands at the Option A site and the USFS would agree to Option A, SEA would reconsider which yard alternative would be preferable.
Option B	Construction and operation of a new rail yard slightly south of Option A	Provide facilities for train staging and dispatch westward to the coal mines and eastward to coal users, avoiding impacts to National Grasslands	Soils, Land Use (grazing/ranching), State lands, surface water, air quality, vegetation, wildlife, socioeconomics, cultural resources	

6.7 MISSOURI RIVER BRIDGE

As discussed in Chapter 2, at this point, DM&E is still considering two alternatives concerning its existing rail bridge over the Missouri River between Pierre and Fort Pierre, South Dakota. These alternatives include rehabilitation of the existing bridge or construction of a new bridge approximately 30 feet upstream of the existing bridge. DM&E has indicated to SEA that the engineering analysis to date indicates that modifications to the existing bridge may or may not be feasible to support the anticipated transport of unit coal trains. Therefore, SEA has considered both the rehabilitation of the existing rail bridge and construction of a new bridge as alternatives for crossing the river. A detailed discussion of SEA's analysis associated with the Missouri River bridge alternatives is contained in Chapter 4 and summarized in Tables 5.1-15.

In reviewing potential impacts of the alternatives and determining if differences in the alternatives exist and if one alternative would be preferable, SEA preliminarily concluded that differences in the environmental impacts of the bridge alternatives would potentially occur in the areas of safety, residential and Federal lands, surface water, noise, aquatic and fisheries resources, endangered species, rail transportation, historic resources, and recreation.

The existing DM&E rail bridge crosses the Missouri River in an area used extensively for boating and fishing. Both rehabilitation of the existing bridge and construction of a new bridge would pose safety hazards to boaters, such as hazards from falling building materials during construction and structures in the water for pier work. While these same concerns would apply to both alternatives, they would be substantially greater for the new bridge because of the installation of many new piers. The increased number of piers and the reduced space between piers could increase the potential for boating accidents.

In the area of land use, SEA determined that impacts to land use if the bridge is rehabilitated, would be minimal and that temporary disturbance caused by reconstruction, including noise and temporary trail closures or disturbance necessary to realign existing trails on land and facilities owned by the COE would cease in approximately 2 years. Construction of a new bridge, however, would require more extensive activities, particularly on the river banks in proximity to several residences. Noise levels, human activity and disturbance would be increased accordingly. Additionally, as the new bridge would be built upstream of the existing bridge where all the nearby residences are also located, construction disturbance would be closer, and subsequently louder, than for rehabilitation.

Following completion of new bridge construction, two scenarios exist. If DM&E is successful in transferring ownership of the existing bridge to another party, the existing bridge would remain in place. Minor activities may be necessary to make the bridge suitable for new

uses, such as a bike or pedestrian trail. Such activities would not likely create additional impacts to residential or COE lands. However, if ownership cannot be transferred, the existing bridge would have to be removed according to Coast Guard regulations. Such removal would require salvage activities, anticipated to be similar in nature to construction activities. Noise and other disturbances to residential areas and COE lands around the bridge would be extended over the salvage period, potentially one or two years. Following completion of salvage activities, construction type disturbance would cease.

During rail line operation, impacts to residential areas would be similar as impacts would be related to increases in rail traffic and primarily include increased wayside noise. However, because a new bridge would be closer to several residences, it would result in a greater increase in their noise exposure, although it would likely be only slightly different than the exposure due to the same level of traffic on the existing bridge.

With respect to issues of surface water, aquatic and fisheries, and endangered species the main difference in the alternatives would be increased sedimentation and water turbidity, or total suspended solids (TSS). Sedimentation and TSS would be expected to occur as a result of river bank disturbance and in-stream work that would disturb bottom sediments, thus decreasing water clarity and redepositing sediment in other areas. Surface water quality would be reduced and habitat for aquatic and fisheries resources, including both game fish and the endangered pallid sturgeon, could be degraded or reduced, at least while instream activities and bank disturbance, including placement or reinforcement of bridge piers and construction of bridge approaches and abutments, occurred. Because rehabilitation of the existing bridge would require only reinforcement of existing pier and limited, if any, approach or abutment work, rehabilitation is expected to have only minor impacts to water related resources. Construction of a new bridge would require placement of approximately 27 new piers within the river along with earth disturbing activities on each bank, potentially causing erosion of soil into the river. While any reductions in water quality related these activities would be limited to the period of pier installation, they would be greater than those expected from rehabilitation of the existing bridge.

Differences in noise impacts between the bridge alternatives would be similar in nature to those discussed for residential land use. Noise sensitive receptors (comprising 6 within 500 feet of the bridges), would be exposed to increased noise levels during both rehabilitation of the existing bridge or construction of the new bridge. Construction noise would likely be greater, however, because more heavy equipment would be operated closer to residences than if the bridge were merely being rehabilitated. Additionally, should removal of the existing bridge be necessary, noise sensitive receptors would be exposed to construction type noise for the extended period necessary for bridge removal. During operation, some noise sensitive receptors would be exposed to greater noise levels from the closer proximity of the new bridge. However, the

number of noise sensitive receptors within the 65 dBA L_{dn} and 70 dBA L_{dn} noise contours for the overall operation of the project due to the minimal change in overall location of the rail bridge would be similar to that expected to occur should the existing bridge be rehabilitated.

The existing DM&E rail bridge is a swing span bridge which was formerly capable of opening to allow passage of vessels which were too tall to pass under the bridge. The swing span is no longer operational. However, the bridge, constructed originally in 1907, is currently included on the National Register of Historic Places (NRHP). Presently, it can not be determined if rehabilitation of the bridge would alter this status. If rehabilitation is accomplished so as to retain the nature and character of the existing bridge, it would be unlikely to affect the historic status of the bridge. However, if extensive modifications are necessary, the bridge may be determined no longer eligible for the NRHP. Construction of a new bridge would not itself affect the historic status of the existing bridge, provided ownership of the bridge can be transferred and the bridge retained without major modifications for other uses. However, if ownership cannot be transferred, Coast Guard regulations would require that the bridge be removed. Either extensive modification of the existing bridge, altering its historic eligibility, or its removal would be considered a significant impact.

As noted previously in Chapter 4, the section of the Missouri River at the bridge crossing contains a variety of recreational opportunities, including boating, trails, and parks. Impacts to these resources would include those previously discussed such as noise disturbance, trail closures or realignments, and boating safety. Additionally, during rehabilitation or construction activities, navigation restrictions on boat passage or travel under the bridge may be necessary. These would impair use of these areas by recreationists. However, following completion, these affects would largely cease. The exception would be that concerns for boating safety would still remain in association with a new bridge.¹⁹

After considering all the differing impact areas for the Missouri River bridge alternatives, rehabilitation of the existing rail bridge would result in fewer environmental impacts (Table 6-13). This follows SEA's general assessment that using existing rail facilities is less environmentally impacting, and therefore preferable, to construction of new facilities. SEA's position on this is discussed in greater detail in Chapter 2. Although most of the environmental impacts that would result from either of the bridge alternatives would be temporary, limited to the one to two year construction period, SEA believes it is preferable to avoid impacts, even if they are temporary. Therefore, SEA preliminarily concludes that the rehabilitation of the existing rail bridge is the

¹⁹ However, if a new bridge is constructed and ownership of the existing bridge transferred, it could potentially be converted to a bike and pedestrian bridge, connecting the trails on both sides of the river. This would provide enhanced recreational opportunities for current trail users and likely attract additional users.

Table 6-13
Summary Highlights of Environmental Impacts
Missouri River Bridge

Alternative	Description	Purpose	Resources Impacted	SEA's Preliminary Recommendation
Rehabilitation of Existing Bridge	Reinforce existing rail bridge to accommodate unit coal trains	Enable transport of unit coal trains over the Missouri River	Soils, Land Use (Residential, Federal Lands), Surface Water, Noise, Vibration, Fisheries, Safety, Cultural Resources, Recreation	SEA believes it is preferable to avoid impacts, even if temporary. Therefore, SEA preliminarily concludes that rehabilitation of the existing rail bridge is the environmentally preferred alternative. If DM&E submits information indicating rehabilitation of the existing rail bridge is not reasonable and feasible, SEA would re-evaluate this conclusion.
New Construction/ New Ownership	Construction and operation of a new rail bridge and transfer of ownership of existing bridge	Enable transportation of unit coal trains over the Missouri River and development of alternative use for the existing rail bridge	Soils, Land Use (Residential, Federal Lands), Surface Water, Noise, Vibration, Fisheries, Threatened and Endangered Species, Safety, Recreation	
New Construction/ Removal	Construction and operation of a new rail bridge and removal of existing rail bridge	Enable transportation of unit coal trains over the Missouri River with no alternative use for the existing rail bridge	Soils, Land Use (Residential, Federal Lands), Surface Water, Noise, Vibration, Fisheries, Threatened and Endangered Species, Safety, Cultural Resources, Recreation	

environmentally preferred alternative.²⁰ However, in reaching this conclusion, SEA also recognizes DM&E has not yet determined if the existing rail bridge can be rehabilitated. SEA and the Board would consider any determination that the bridge is suitable or unsuitable for rehabilitation as part of its final decision on the project.

* * * * *

²⁰ This assumes that rehabilitation of DM&E's existing bridge is a reasonable and feasible alternative. If DM&E submits information to the contrary, SEA would need to re-evaluate its conclusion. Moreover, the U.S. Coast Guard, as the Federal Agency with primary jurisdiction over the Missouri River Bridge, would be responsible for issuing a bridge permit before DM&E could implement modifications associated with rebuilding its existing bridge (if such modifications were extensive) or build a new bridge across the Missouri River at Pierre, South Dakota.

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CHAPTER 7

SEA'S PROPOSED ENVIRONMENTAL MITIGATION

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CHAPTER 7
SEA'S PROPOSED ENVIRONMENTAL MITIGATION

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CHAPTER 7

SEA'S PROPOSED ENVIRONMENTAL MITIGATION

7.0 INTRODUCTION

Chapter 7 presents the Section of Environmental Analysis' (SEA) preliminary recommended environmental mitigation. SEA's mitigation is based on its environmental analysis of the Powder River Basin (PRB) Expansion Project, which is the largest and most challenging construction proposal ever before the Surface Transportation Board. It involves approximately 1,000 miles of rail line, including 280 miles of new rail construction and nearly 600 miles of reconstructed rail line, traverses three states, necessitates the participation of five cooperating agencies, entails numerous and diverse environmental issues, and involves various alternatives as well as bypass proposals, many of which have their own potentially significant environmental impacts. SEA also analyzed the environmental impacts of constructing and operating new rail yards.

In conducting its environmental analysis, SEA considered a wide variety of interests. These included communities, home owners, farmers and ranchers, Native American Tribes, and special resources associated with this project (such as National Grasslands through which the proposed rail line would pass). As presented in detail in Chapter 1 and summarized further in this Chapter, SEA went to great lengths to identify and address the potential environmental issues. SEA undertook extensive public outreach activities to give interested parties, agencies, and the general public opportunities to learn about the project, define issues, and participate in the environmental review process. SEA also conducted appropriate technical analyses, consultations, and site visits and gathered extensive environmental data.

The potential environmental effects SEA identified, both beneficial and adverse, could be substantial. As discussed in detail in Chapters 3 and 4, the potential environmental benefit of this project is that DM&E's existing system in Minnesota and the eastern half of South Dakota, which is currently in generally poor condition, would be completely upgraded to allow movement of unit coal trains, thus enhancing the safety of DM&E's existing rail operations. On the other hand, the dramatic increase in the number of trains operating on the existing system (from approximately 3 trains a day to 37) – and the impact caused by construction and operation of a lengthy new rail line through generally pristine rural areas – would have significant environmental consequences, some of which, such as noise, would be difficult to mitigate. SEA's environmental analysis and its resulting preliminary environmental mitigation recommendations reflect the variety and complexity of the environmental issues and the most reasonable and feasible way to minimize some of the environmental impacts discovered during the course of SEA's environmental review.

On December 10, 1998, the Surface Transportation Board (Board) found that the new construction and operation proposed by DM&E in its Application satisfies the transportation aspects of 49 U.S.C. 10901.¹ In making this finding, however, the Board explained that the project could not be finally approved until the environmental review process, required under the National Environmental Policy Act (NEPA) and related laws, is completed and the Board has the opportunity to assess fully the potential environmental effects and the cost of any environmental mitigation that it might impose on the project. The Board made clear in its decision that it would issue a further decision on the entire proposed project following the completion of the environmental impact statement process and that no new construction could begin until a final decision approving the construction is issued and has become effective.

The primary purpose of including SEA's preliminary mitigation recommendations in the Draft EIS is to provide the public, agencies, Tribes, and other interested parties the opportunity to review and comment on SEA's preliminary environmental mitigation measures that would, to some extent, reduce the potential environmental impacts of the proposed PRB Expansion Project.

The preliminary environmental mitigation measures set forth in this chapter generally apply to both DM&E's proposed new rail line construction and the reconstruction upgrade of DM&E's existing rail line. Only a few of the environmental mitigation measures in this Draft EIS are designed to apply to specific communities (i.e., Rochester and Mankato, Minnesota). This is so because, based on the information available to date, the potential environmental impacts on communities associated with the PRB Expansion Project appear to be largely the same. Regardless of the individual characteristics of the communities involved, each of the affected communities would experience the same construction-related impacts and number of trains (37 trains per day operating over the rehabilitated existing rail line to move PRB coal and DM&E's

¹ In reviewing rail construction proposals under 49 U.S.C. 10901, the Board examines whether an applicant is financially fit, whether there is a public need for the proposed new service, and whether the project is in the public interest and will not unduly harm existing rail services. In determining that these criteria have been met by DM&E's proposal, the Board assessed the feasibility of the proposed construction project, both financially and otherwise, including projections for increased demand for PRB coal and the capacity to meet that demand.

In enacting the ICC Termination Act in 1995, Congress intended to facilitate rail line construction. Congress did so by changing the statutory standard from requiring approval, if the agency finds that a project is consistent with the public convenience and necessity, to requiring approval unless the agency finds that the project is inconsistent with the public convenience and necessity. The Board noted (decision at 17) that "[u]nder the revised statute, proposed rail constructions are to be given the benefit of the doubt."

existing agricultural traffic, and 34 new coal trains to and from the Powder River Basin).² Moreover, the potential environmental impacts of the PRB Expansion Project on noise sensitive receptors is not related to the community in which the receptors are located, but rather, the proximity of residences to the rail right-of-way, regardless of the community. Similarly, ranchers would experience the same adverse environmental impacts of moving cattle back and forth across an active rail line, no matter whether their ranch is located in Wyoming or South Dakota.

SEA also has not designed any environmental mitigation specific to the two remaining potential bypass routes around Brookings, South Dakota and Rochester, Minnesota. If SEA identifies one or more of these bypasses as environmentally preferable in the Final EIS, SEA will develop and recommend environmental mitigation applicable to that bypass for the Final EIS, if appropriate.

SEA requests comments on the preliminary environmental mitigation measures presented in this chapter. In particular, if commenters believe that the unique circumstances of a community warrant individually-tailored environmental mitigation in addition to the environmental mitigation in the Draft EIS, SEA urges the commenter to submit suggestions for environmental mitigation, and why it would be appropriate, to SEA during the public comment period. Based on public and agency comment, SEA will conduct additional environmental analysis and further consultations, where necessary, and finalize its environmental mitigation recommendations. The Final EIS will address the comments and will contain SEA's final environmental mitigation recommendations for the Board to consider in making its final decision on the PRB Expansion Project.

7.1 OVERVIEW OF SEA'S APPROACH TO RECOMMENDED MITIGATION

In conducting the environmental review process, SEA has taken the "hard look" NEPA requires of the environmental consequences of the proposed PRB Expansion Project. Its review included both new railroad line, rail operations, and reconstructed track.³ In its environmental

² By contrast, in recent rail merger proceedings, the merger related increase in rail traffic along particular segments varied widely, and it was appropriate to tailor mitigation to reflect the differences in anticipated environmental impacts.

³ The Board does not typically review rail reconstruction or upgrading projects. However in this case, the U.S. Army Corps of Engineers (COE) requested Board review because of its jurisdiction over the numerous waterways and wetlands potentially affected by reconstruction of DM&E's existing rail line. The COE is a cooperating agency for this EIS, and would ultimately be issuing a Section 404 permit for construction activities that affect wetlands and waters within COE's jurisdiction, if the Board gives final approval. In conducting its public interest review for the permit, the COE considers potential benefits and impacts of the project. SEA's environmental review of reconstruction facilitates the COE review.

review, SEA conducted a thorough and comprehensive analysis of the potential environmental effects associated with the project, which includes numerous alternatives as presented in this Draft EIS.⁴ Section 7.1.1 provides an overview of SEA's environmental analysis, consultations with various interests such as government agencies, Tribes, and affected communities, and extensive outreach. As a result of these efforts, SEA has developed preliminary environmental mitigation measures, where appropriate, to address environmental impacts identified during the course of its environmental review process.

7.1.1 Overview of SEA's Environmental Review

SEA's in-depth environmental review process included:

- Fourteen agency and public meetings, called scoping meetings, held in all three affected states to provide the public with an opportunity to learn about the potential environmental issues associated with DM&E's proposal and determine the scope of the environmental analysis. Also, SEA received and considered over 5,000 written public comments from a wide variety of interests, including individuals, agencies, Tribes and communities.
- Independent environmental analysis, including preparing biological surveys for threatened and endangered species, and cultural resource reports and reviews for paleontological and archaeological sites and historic resources. In addition, SEA conducted extensive analyses that addressed extensive data on safety, air quality, grade crossing safety and potential delays, railroad and vehicular traffic volumes, wetlands and aquatic resources, noise, wildlife migration, geology and soils, and potential impacts to land use, such as ranches, farms, and communities, including environmental justice communities, associated with the construction of 280 miles of new rail line and the upgrading of 600 miles of existing rail line. In conducting its environmental analysis, SEA was assisted by several agencies with technical expertise. Five government agencies participated as cooperating agencies in the preparation of the Draft EIS, including the preliminary recommended mitigation. The cooperating agencies are:

⁴ The alternatives which are discussed in detail in Chapters 2 and 6, include three new, approximately 280 miles, routes into the PRB (including various smaller segment alternatives designed to potentially minimize environmental impacts), as well as the construction of new track segments, including possible bypasses, along DM&E's 600-mile existing rail line. For example, the railroad proposes to build a new 13.31-mile loop south of the town of Mankato, Minnesota and a new 2.94-mile rail line near Owatonna, Minnesota.

- U.S. Department of Agriculture, Forest Service
 - U.S. Department of Interior, Bureau of Land Management
 - U.S. Army Corps of Engineers
 - U.S. Department of Interior, Bureau of Reclamation
 - U.S. Coast Guard
- An extensive public outreach program to identify the public's environmental concerns related to this project. This included public meetings, numerous site visits, making all Board decisions related to this proceeding available over the agency's official website, and establishing a toll-free project hotline. In addition, SEA conducted comprehensive mailings that included newsletters and other informational material. These outreach materials provided descriptions of the project and SEA's environmental review process to facilitate and encourage public understanding and participation.
- Evaluation of concerns raised by government agencies and the public, including communities, Tribes, small businesses, farmers, ranchers, and environmental groups. Their concerns included the potential for safety impacts (particularly emergency vehicle access), noise/vibration increases, property value decreases, air quality impacts, effects on cultural resources and Tribal traditions, emergency vehicle access, environmental justice issues, and broad quality of life issues.

7.1.2 Summary of Significant Environmental Impacts Which May Warrant Mitigation

Based on its environmental analysis, SEA determined that the PRB Expansion Project could result in significant environmental impacts in the following issue areas:

- Safety, including emergency vehicle access and response.
- Transportation, including grade crossing safety and potential delays.
- Communities.
- Cultural and Archaeological Resources.
- Land Use.
- Air Quality.
- Noise.
- Environmental Justice.
- Geology and Soils.
- Paleontological Resources.
- Biological Resources, including vegetation and threatened and endangered species.
- Water Resources, including wetlands.
- Visual Effects/Aesthetics.

SEA's recommended preliminary environmental mitigation addresses these potentially significant impacts. However, SEA notes that not all of the effects of this project are mitigatable. For example, horn noise from train operations to residents located in proximity to the rail line would be significant and could not be fully mitigated without compromising safety. Even with mitigation, there would be some vehicle delay at grade crossings, visual impacts on the grasslands, and impacts to wetlands and riparian habitat.

7.1.3 Limits of the Board's Conditioning Power

The Board has limited authority to impose conditions to mitigate potential environmental impacts. As a government agency, the Board can only impose conditions that are consistent with its statutory authority. Accordingly, any conditions the Board imposes must relate directly to the transaction before it, must be reasonable, and must be supported by the record before the Board. Thus, the Board's practice consistently has been to mitigate only those impacts that result directly from the proposed action. The Board typically does not require mitigation for pre-existing environmental conditions, such as the effects of current railroad operations.

As the Board explained in its December 10, 1998 decision, in considering whether to grant final approval to this project, the Board will assess fully the potential environmental effects and the cost of environmental mitigation that it might impose on the project. In making its decision, the Board will consider the Draft EIS, Final EIS, public comments, and SEA's final environmental mitigation recommendations.

7.1.4 Preliminary Nature of Environmental Mitigation

SEA emphasizes that the recommended environmental mitigation measures in this Draft EIS are preliminary and it invites public and agency comments on these proposed environmental mitigation measures. In order for SEA to effectively assess the comments, it is critical that the public be specific regarding any desired mitigation and the reasons why the suggested mitigation would be appropriate.

SEA will make its final recommendations on environmental mitigation to the Board in the Final EIS after considering all public comments on the Draft EIS and conducting further environmental analysis, agency consultations, and site visits, as appropriate. The Board will then make its final decision regarding this project and any environmental conditions it might impose. When considering whether to grant final approval on the proposed transaction, the Board will consider the potential environmental effects and the approximate cost of any environmental mitigation it might impose on the project.

7.2 ROLE OF COOPERATING AGENCIES IN DEVELOPING PROPOSED ENVIRONMENTAL MITIGATION MEASURES

In addition to assisting in SEA's environmental analysis, the cooperating agencies participated in developing preliminary recommended mitigation. In particular, the Forest Service, with input from Bureau of Land Management, developed mitigation measures designed to protect National Grasslands and other resources in the project area.

7.3 ROLE OF NATIVE AMERICAN TRIBES IN DEVELOPING ENVIRONMENTAL MITIGATION MEASURES

The Board recognizes the sovereignty of Tribal nations and Native American's strong cultural ties to the land and resources potentially affected by the PRB Expansion Project. Although none of the proposed PRB Expansion Project route alternatives cross any existing American Indian Reservations, Native American occupation of the area of the proposed route has been well documented, and extends from historic times to the present.

In view of potential Native American concerns associated with the project, SEA initiated government-to-government consultation with 32 federally recognized Tribes having historic, aboriginal, or current ties to the project area. SEA asked each federally recognized Tribe to designate a traditional or cultural representative to represent the Tribe in the consultation efforts.

This consultation was intended to provide each Tribe an opportunity to participate with the Federal government in addressing the potential impacts of the proposed project.

Moreover, out of respect for cultural differences, the wisdom of the elders, and the historically unresolved issue of treaties, SEA invited several additional Tribal groups and organizations to participate in consultation meetings.

To date there have been:

- Two major meetings with Tribal representatives, SEA and cooperating agencies, the Advisory Council on Historic Preservation, State Historic Preservation Officers of Wyoming and South Dakota, and the Applicant to address Tribal participation in the Section 106 process of the National Historic Preservation Act.
- An inter-tribal meeting to review preliminary archeological survey findings in South Dakota.

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- Numerous meetings with SEA and individual Tribal representatives and Tribal culture committees, elder groups, council chairman, and individual council members.

As a result of this consultation process, SEA, the cooperating agencies, Tribes, and Applicant have developed a Programmatic Agreement and Identification Plan (PA) and a Memorandum of Agreement (MOA), providing Tribes the opportunity for substantive participation in the environmental and historic review process under NEPA and Section 106 of the National Historic Preservation Act in this case. The purpose of the PA is to ensure the proper and respectful identification and handling of burial sites and other sacred artifacts that may be discovered in the project area. The MOA is designed to address sacred plants and migration routes of Tribal significance. Both the PA and MOA are attached in the appendices to permit public review and comment.

7.4 ROLE OF COMMUNITIES IN DEVELOPING ENVIRONMENTAL MEASURES AND BYPASS PROPOSALS

Throughout the project, SEA worked closely with affected communities to understand their environmental concerns and facilitate their participation in the environmental review process. As discussed in Chapter 1 and Appendix C, "Scoping and Outreach Materials," SEA's outreach efforts were extensive. To respond to concerns raised by this effort, SEA conducted site visits to collect data, assess first-hand the potential environmental impacts the project would have on particular communities, conduct additional studies, and report back to the communities on the status of the environmental review.

SEA's list of recommended environmental mitigation measures reflect the communities' inputs and concerns. As part of this dialogue, SEA encouraged communities to offer suggestions for mitigation and bypass proposals. Specifically, on January 6, 1999, the City of Rochester, Minnesota (Rochester), requested that SEA consider a southern bypass corridor as an alternative to DM&E's proposed plan to rehabilitate its existing rail line and operate additional rail traffic, primarily coal trains, through Rochester. SEA sought additional information to assist it in determining whether Rochester's bypass proposal is a reasonable and feasible alternative designed to meet the purpose and need expressed in DM&E's proposal before the Board. To provide the same opportunity to other interested communities, SEA issued an April 20, 1999 Notice to the Parties providing time frames in which bypass proposals could be submitted, as certain communities had requested. Three other communities (Owatonna, Minnesota and Pierre and Brookings, South Dakota) concerned about proposed traffic increases on DM&E's existing system submitted alternative bypass proposals that would divert traffic from the communities. Subsequently, Owatonna withdrew its bypass proposal. In the Draft EIS, SEA has concluded that the Rochester and Brookings bypass proposals are reasonable and feasible alternatives, warranting

detailed environmental analysis in this document. Upon close examination, SEA has concluded that the Pierre bypass does not appear to be reasonable and feasible.

SEA also encouraged DM&E to communicate with concerned residents and affected communities and use community input to develop voluntary mitigation and negotiated agreements to address community concerns. Often, negotiated agreements can result in more far-reaching mitigation for communities than mitigation the Board could unilaterally impose.

7.5 NEGOTIATED AGREEMENTS

As an alternative to the mitigation that the Board would unilaterally impose on DM&E (notwithstanding mitigation required by other Federal regulatory agencies that may have jurisdiction over potentially affected resources), SEA has encouraged DM&E to negotiate mutually acceptable agreements with affected communities and other government entities to address potential environmental impacts, including ways to share the costs associated with project-related environmental mitigation measures. Negotiated Agreements could be with neighborhoods, communities, counties, cities, regional coalitions, states and other entities. If DM&E submits any negotiated agreements with communities or other entities to the Board, the Board would then require compliance with the terms of any such agreements as environmental conditions in any final decision approving the proposed PRB Expansion Project. These negotiated agreements would supersede any environmental conditions for that particular community or other entity that the Board would otherwise impose.

7.6 DESIGN OF PROPOSED ENVIRONMENTAL MITIGATION

Based on the information available to date, consultations with appropriate agencies, and extensive environmental analysis, SEA developed preliminary environmental mitigation measures to address the environmental impacts of this project, including new construction and upgrading the existing line, as well as anticipated rail operations. SEA's recommended environmental mitigation is designed to address:

- The safety of rail operations. For example, SEA has proposed environmental mitigation that would require DM&E to submit grade crossing safety plans to the applicable state and local road and highway jurisdictions for their review and approval and to install reflective material on the backside of all passive crossing warning devices (such as crossbucks) and verify to the Board that it has completed this task prior to moving any coal trains to and from the PRB.

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- The concerns of communities. To accomplish this, DM&E, among other things, would be required to: 1) provide citizens, communities, agencies, Tribes, and other interested parties with a liaison, or point-of-contact, for resolving issues that may arise during construction or operation of the proposed project; 2) install temporary notification signs to advise motorists of the impending increase in train traffic and train speeds along its existing system and commencement of rail operations along its rail lines; 3) provide a toll-free number and contact point to all emergency response departments throughout the project area to report emergency situations and obtain train movement information; and 4) comply with the mitigation tailored to meet unique concerns of such communities as Rochester and Mankato, Minnesota.
- The regulatory requirements of the cooperating and other agencies.
- The potential for short-term construction-related environmental impacts. Specifically, SEA has included numerous Best Management Practices for construction/upgrade activities and would require dust control and erosion prevention activities.
- The timing of when mitigation is implemented. For example, some of SEA's recommended measures would require DM&E to undertake certain activities before construction begins, such as fencing the boundaries of its rights-of-way and surveying raptor nests to minimize construction activity near them during nesting periods. Other measures would require DM&E to undertake certain activities after construction is complete, such as surveying whether construction had an effect on habitat functions and values and initiating land reclamation as soon as possible after construction.
- The potential for a material change in the facts or circumstances upon which the Board relied in imposing specific environmental mitigation conditions in its final decision. Specifically, SEA has included a condition stating that if there are any material changes in the facts or circumstances upon which SEA relied to conduct its analysis or the Board relied upon in imposing specific environmental mitigation conditions, and upon determination or petition by any party who demonstrates such material change, the Board may review the continuing applicability of its final mitigation.
- The need to provide the Board with assurance that DM&E is complying with all environmental mitigation the Board imposes. To accomplish this, SEA has included a requirement that DM&E certify to the Board that it has complied with the terms of certain environmental mitigation measures (including grade crossing improvements). Another measure states that the Applicant shall retain a third-party contractor to assist SEA in monitoring and enforcement of mitigation measures on a regular basis until the Applicant

has completed construction and reconstruction activities. Monitoring would include periodic site visits and preparation of brief reports to SEA concerning the status of mitigation implementation. This assistance to SEA would continue for a period that would include covering the first year of operation, or for any oversight period the Board imposes in this case.

7.7 GUIDE TO ENVIRONMENTAL MITIGATION MEASURES

As discussed above, SEA notes that most of its preliminary environmental mitigation measures would apply equally to all communities that would potentially experience effects of the proposed project. In other locations with unique circumstances, SEA tailored the mitigation to address a specific concern. For example, in Rochester, Minnesota, the location of the Mayo Clinic, SEA is recommending that mitigation measures include vibration studies to determine whether there would be adverse effects to vibration-sensitive medical equipment. In Mankato, Minnesota, the proposed project would pass near an existing flood-control project; there SEA is recommending mitigation to address flood issues for that community. In Pierre, South Dakota, SEA is recommending environmental mitigation to enable assessing the feasibility of whether DM&E's existing bridge over the Missouri River could be rehabilitated or a new bridge built.

7.8 PRELIMINARY ENVIRONMENTAL MITIGATION MEASURES

7.8.1 SAFETY

7.8.1.1 Grade Crossing/Warning Devices

1. Prior to initiating any construction activities related to this project, Applicant shall develop adequate grade crossing safety plans to minimize traffic delay and improve vehicular safety at grade crossings and submit these plans to the appropriate state and local transportation agencies for their review and approval.
2. Prior to initiating any construction activities related to this project, Applicant shall consult with the Federal Railroad Administration, State Departments of Transportation, and appropriate local agencies to develop a priority list for upgrading grade crossing warning signals on the existing rail line. To the extent possible, Applicant shall prioritize for actual improvement those warning signals at grade crossings on the existing rail line that have the greatest predicted accident frequency increase.
3. Applicant shall maintain the new and existing rail line and grade crossing warning devices according to Federal Railroad Administration track safety standards (49 CFR Part 213).

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7.7 GUIDE TO ENVIRONMENTAL MITIGATION MEASURES

As discussed above, SEA notes that most of its preliminary environmental mitigation measures would apply equally to all communities that would potentially experience effects of the proposed project. In other locations with unique circumstances, SEA tailored the mitigation to address a specific concern. For example, in Rochester, Minnesota, the location of the Mayo Clinic, SEA is recommending that mitigation measures include vibration studies to determine whether there would be adverse effects to vibration-sensitive medical equipment. In Mankato, Minnesota, the proposed project would pass near an existing flood-control project; there SEA is recommending mitigation to address flood issues for that community. In Pierre, South Dakota, SEA is recommending environmental mitigation to enable assessing the feasibility of whether DM&E's existing bridge over the Missouri River could be rehabilitated or a new bridge built.

7.8 PRELIMINARY ENVIRONMENTAL MITIGATION MEASURES

7.8.1 SAFETY

7.8.1.1 Grade Crossing/Warning Devices

1. Prior to initiating any construction activities related to this project, Applicant shall develop adequate grade crossing safety plans to minimize traffic delay and improve vehicular safety at grade crossings and submit these plans to the appropriate state and local transportation agencies for their review and approval.
2. Prior to initiating any construction activities related to this project, Applicant shall consult with the Federal Railroad Administration, State Departments of Transportation, and appropriate local agencies to develop a priority list for upgrading grade crossing warning signals on the existing rail line. To the extent possible, Applicant shall prioritize for actual improvement those warning signals at grade crossings on the existing rail line that have the greatest predicted accident frequency increase.
3. Applicant shall maintain the new and existing rail line and grade crossing warning devices according to Federal Railroad Administration track safety standards (49 CFR Part 213).

7.8.1.2 Emergency Response

4. At least one month prior to initiation of construction activities in the area, Applicant shall provide the information described below, as well as any additional information, as appropriate, to each local emergency response organization or other similar body for communities within the project area regarding project-related construction and operation of both the new and existing rail line:
 - The schedule for construction throughout the project area, including the sequence of construction and reconstruction of grade crossings and approximate schedule for these activities at each crossing.
 - Expected schedule for change in rail line operations, including when changes in train speeds and levels of traffic are anticipated to occur, and current and new train speeds and levels of rail traffic.
 - A toll-free number for the Applicant's contact who shall be available to answer questions or attend meetings for the purpose of informing emergency service providers about the project construction and operation.
 - Revisions to this information, including changes in construction schedule, as appropriate.
5. Applicant shall consult with the communities of Rochester, Owatonna, and Mankato, Minnesota and Brookings and Pierre, South Dakota, and any other affected communities that so request, to coordinate train movements and emergency response and discuss the possible installation by the Applicant of a real-time train location monitoring system to connect grade crossing warning devices to nearby traffic signals and provide a display in the local emergency response center showing the position of the grade crossing warning signals.
6. Applicant shall fund participation in a training session at the national training center in Pueblo, Colorado, for a maximum of four representatives of the emergency response organization or coordinating body for affected communities that express an interest in such training, each year for three years from the date DM&E initiates construction activities associated with the project.

7. Applicant shall coordinate with the appropriate state Departments of Transportation, counties, and affected communities to develop a program for installation of temporary notification signs or message boards on railroad property at public grade crossings, determined by the State and/or County to warrant such measures, clearly advising motorists of the impending increase in train traffic and train speeds along its existing system and commencement of operations along its new rail line. The format and lettering of these signs shall comply with the U.S. Department of Transportation, Federal Highway Administration's Manual on Uniform Traffic Control Devices and shall be in place no less than 30 days before, and 6 months after, completion of project-related construction and reconstruction activities in the area. As an alternative, Applicant shall conduct a media campaign throughout the counties and communities surrounding the rail line providing information and notice to the public of project-related changes along its existing system and commencement of operations along its new rail line. This campaign shall include the use of different media (radio, television, newspaper, public meetings, etc.) and may include such things as public service announcements, advertisements, or legal notices. Applicant shall certify to the Board that it has complied with this condition prior to moving coal trains to and from the Powder River Basin.
8. For each of the public grade crossings on the new and existing rail line, Applicant shall provide and maintain permanent signs prominently displaying both a toll-free telephone number and a unique grade crossing identification number in compliance with Federal Highway Regulations (23 CFR Part 655). The toll-free number shall be answered 24 hours per day by Applicant's personnel. Where Applicant's right-of-way is in close proximity to another rail carrier's crossing, Applicant shall coordinate with the other rail carrier to establish a procedure regarding reported accidents and grade crossing device malfunctions.
9. Applicant shall consult with interested communities along its new and existing rail line to identify alternative safety measures to eliminate the need to sound train horns in the community, in accordance with Federal Railroad Administration's final rule on the *Use of Locomotive Horns at Highway-Rail Grade Crossings*.
10. Applicant shall install reflective material on the back side of all passive crossing warning devices, such as crossbucks, on the new and existing rail line. Reflective material shall be installed so that headlights from vehicles approaching the grade crossing on the opposite side of the rail line will strike the material and illuminate it to provide a continual illumination in the absence of a passing train and a flashing appearance when a train is passing due to the space between the rail cars. Applicant shall certify to the Board that it

has complied with this condition prior to moving coal trains to and from the Powder River Basin.

11. To the extent possible, Applicant shall minimize trains blocking grade crossings throughout its system.

7.8.1.3 Track Warning Devices and Track Infrastructure

12. Applicant shall properly maintain its new and existing rail line. Maintenance shall include trimming vegetation on railroad property that obscures visibility of oncoming trains and assuring that rail, railroad ties, track fastenings, and ballast material are in good repair, and that warning devices operate properly and are legible.

7.8.1.4 Hazardous Material Handling Issues

13. Prior to initiating any project-related construction activities, Applicant shall develop a Spill Prevention, Control, and Countermeasure Plan (Plan) to prevent spills of oil or other petroleum products and other hazardous materials during construction and reconstruction activities, and operation and maintenance of the rail line. At a minimum, the Plan shall address the following:
 - Definition of what constitutes a spill.
 - Requirements and procedures for reporting spills to appropriate government agencies.
 - Methods of containing, recovering, and cleaning up spilled material.
 - Equipment available to respond to spills and their location.
 - List of governmental agencies and Applicant's management personnel to be consulted with in the event of a spill.

In the event of a spill, Applicant shall comply with its Plan and applicable Federal, state, and local regulations pertaining to containment of the spill and appropriate clean up.

14. Applicant shall comply with Department of Transportation Hazardous Materials regulations (49 CFR Parts 171 and 179) when handling, storing, or disposing hazardous materials. Applicant shall dispose of all materials that cannot be reused in accordance with applicable Federal, state, and local waste management regulations.

15. Applicant shall develop internal emergency response plans to allow for agencies and individuals to be notified in an emergency and to locate and inventory emergency equipment for use in dealing with emergencies. Applicant shall provide the emergency response plans to the relevant state and local entities prior to moving coal trains to and from the Powder River Basin.
16. Applicant shall notify the U.S. Fish and Wildlife Service, and the appropriate state departments of natural resources, in the event of a reportable hazardous materials release with the potential to affect wetlands or wildlife habitat(s), particularly those of Federally threatened or endangered species.
17. Applicant shall use established standards for recycling or reuse of construction materials such as ballast and rail ties. When recycling construction materials is not a viable option, Applicant shall use disposal methods that comply with applicable solid hazardous waste regulations.

7.8.1.5 Fire Prevention

18. Prior to initiating any construction activities related to this project, Applicant shall develop an adequate plan for fire prevention and suppression and subsequent land restoration during construction and operation of both the new and existing rail line. Applicant's plan shall ensure that all locomotives are equipped with functioning spark arrestors on exhaust stacks and fire extinguishers suitable for flammable liquid fires and provide for the installation of low-spark brake shoes.

7.8.1.6 Miscellaneous

19. During project-related construction at grade crossings, Applicant, to the extent practicable, shall maintain at least one open lane of traffic at all times, to allow for the quick passage of emergency and other vehicles.
20. In undertaking project-related construction activities, Applicant shall use construction materials and safety practices recommended by the American Railway Engineering Association (AREA) and the recommended standards for track construction and reconstruction in the AREA Manual for Railway Engineering. Applicant shall maintain the track and provide for track inspection in compliance with AREA and Federal Railroad Administration requirements at 49 CFR 213.

21. Applicant shall adhere to Federal Occupational Safety and Health Administration (OSHA), Federal Railroad Administration, and State construction and operational safety regulations to minimize the potential for accidents.
22. Applicant shall refuel locomotives at designated refueling locations. Applicant shall exercise care during refueling to prevent overflows.
23. Applicant shall make Operation Lifesaver programs available to communities, schools, and other organizations located along the new and existing rail line.

7.8.2 TRANSPORTATION

24. To the extent possible, Applicant shall confine all project-related construction traffic to a temporary access road within the right-of-way or established public roads. Where traffic cannot be confined to temporary access roads or established public roads, Applicant shall make necessary arrangements with landowners to gain access from private roadways. The temporary access roads shall be used only during project-related construction.

7.8.3 LAND USE AND COMMUNITY CONCERNS

25. Prior to initiation of construction or reconstruction activities related to this project, Applicant shall establish a Community Liaison to consult with affected communities, farmers, ranchers, businesses, landowners, and agencies; develop cooperative solutions, be available for public meetings; and conduct periodic public outreach. This Community Liaison shall have access to Applicant's upper management. Applicant shall provide the name and phone number of the Community Liaison to mayors and other appropriate local officials in each community through which the new and existing rail line passes.
26. In many communities, adjacent property owners have encroached on Applicant's existing right-of-way. Applicant shall make reasonable attempts to identify and notify these individuals of its proposed project-related reconstruction schedule through these areas prior to beginning reconstruction activities in the area.
27. Applicant shall erect temporary construction fencing, where appropriate, prior to initiation of construction or reconstruction activities related to this project. Applicant shall inspect temporary construction fencing regularly and promptly repair any damage.

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26. In many communities, adjacent property owners have encroached on Applicant's existing right-of-way. Applicant shall make reasonable attempts to identify and notify these individuals of its proposed project-related reconstruction schedule through these areas prior to beginning reconstruction activities in the area.
27. Applicant shall erect temporary construction fencing, where appropriate, prior to initiation of construction or reconstruction activities related to this project. Applicant shall inspect temporary construction fencing regularly and promptly repair any damage.

28. Applicant shall install permanent fencing, where appropriate, along the new and existing rail line. Applicant shall consult with the South Dakota Department of Game, Fish and Parks, Wyoming Game and Fish Department, and Minnesota Department of Natural Resources and affected landowners to determine appropriate fencing designs. Applicant shall inspect all fencing regularly and shall promptly repair any damaged fencing.
29. At least 48 hours prior to initiating herbicide applications, Applicant shall make reasonable attempts to notify residents of property adjacent to the right-of-way.
30. Applicant shall ensure that all areas disturbed by project-related construction or reconstruction activities which are not the railroad's property (such as access roads, haul roads, crane pads, and borrow pits), promptly are restored as closely to their original condition as is practical following conclusion of project-related construction or reconstruction activities at that site.

7.8.3.1 Agriculture/Ranching

31. Applicant shall provide its reconstruction and construction schedule to affected farmers and ranchers to allow them to determine whether they should continue to crop or graze right-of-way areas or discontinue such activities due to impending construction and reconstruction activities related to this project.
32. Applicant's Community Liaison, established by Condition 25, shall work with farmers and ranchers to remedy any damage to crops, pastures, or rangelands caused by Applicant's construction or reconstruction activities related to the project. The Community Liaison also shall have authority to negotiate with farmers and ranchers regarding the possibility of train-free periods to facilitate movement of equipment or livestock from one side of the rail line to the other.
33. In negotiations with farmers and ranchers, Applicant shall be guided by the Land Use Mitigation Policy and Plan negotiated by the Applicant with the Landowner Advisory Board, which addresses the following areas of concern:
 - Direct and indirect land loss.
 - Displacement of capital improvements (wells, windmills, corrals, outbuildings, irrigation systems, etc.).
 - Noxious weed control.
 - Fencing.
 - Livestock casualty.

- Fire prevention and suppression
- Fire casualty.
- Construction-related impacts.

7.8.3.2 Residential

34. Applicant's project-related construction vehicles, equipment, and workers shall not access work areas by crossing residential properties unless negotiated with and agreed to by the property owner.
35. In residential areas, Applicant shall store its equipment and materials in established storage areas or on Applicant's property whenever possible.
36. The Community Liaison, established in Condition 25, shall work with affected landowners to appropriately redress any damage to the landowner's property caused by Applicant's project-related construction or reconstruction activities.

7.8.3.3 Business and Industrial

37. Applicant's project-related construction vehicles, equipment, and workers shall not access work areas by crossing business or industrial areas, including parking areas or driveways, unless negotiated with the business owner.
38. In business and industrial areas, Applicant's project-related equipment and materials shall be stored in established storage areas or on Applicant's property. Parking of Applicant's equipment, vehicles, or storage of materials along driveways or in parking lots is prohibited unless agreed to by the property owner.
39. The Community Liaison, established in Condition 25, shall work with affected businesses or industries to appropriately redress any damage to the business's property caused by Applicant's project-related construction or reconstruction activities.
40. Applicant shall insure that entrances and exits for businesses are not obstructed by project-related construction activities except as required to move equipment.

7.8.3.4 Minerals and Mining

41. To help maintain the existing natural environment to the extent practicable, Applicant shall utilize materials such as rock, gravel, and sand available from local sources in its project-related activities.
42. Applicant shall consult with the owners of existing mines and quarries in the project area, particularly the quarry in Mankato, Minnesota, if Alternative M-3 is selected, to ensure that project-related construction and reconstruction activities minimize impacts to mine related operations.
43. Prior to initiating construction of the new rail line, Applicant shall obtain any necessary permits from the U. S. Department of Interior, Bureau of Land Management regarding mineral removal and oil and natural lessees.
44. Applicant shall obtain a Special Use Permit from the U.S. Forest Service (USFS) granting an easement for the rail line to cross lands administered by the USFS designated as National Grasslands prior to initiating any project-related construction activities on USFS lands. Any conditions required under this easement, in addition to those imposed by the Board and those set forth in Attachment A to this chapter, shall be adhered to by the Applicant for activities on USFS lands.
45. Applicant shall obtain the appropriate permit from the U.S.D.I. Bureau of Reclamation for crossing any lands, irrigation ditches, or canals which are part of the Angostura Irrigation District.
46. No U.S. Fish and Wildlife Service (USFWS) lands, such as waterfowl production areas (WPAs) and wetland easements, would be crossed by the project-related construction or reconstruction. However a new rail yard facility under either Alternative B or C could be located across a wetland easement. In that event, Applicant shall acquire and provide to the USFWS additional wetland easement(s), replacing in kind, function, and value, and subject to USFWS approval and necessary environmental reviews and permitting, the wetland easement(s) lost from rail yard construction.

7.8.3.5 State Lands

47. If any project-related construction activities are required on state lands, Applicant shall consult with the appropriate state personnel prior to conducting these activities.

48. Applicant shall consult with managers of state lands to determine peak use periods for the state lands that provide for over-night use. Applicant shall attempt to schedule project-related construction activities to avoid these periods to the extent practical.

7.8.3.6 Utility Corridors

49. Applicant shall make reasonable efforts to identify all utilities within its existing right-of-way or that cross its existing right-of-way. Applicant shall notify the owner of each utility identified prior to project-related construction and reconstruction activities and coordinate with the owner to minimize damage to utilities. Applicant shall also consult with utility owners to design the rail line so that utilities are protected during project-related construction and reconstruction activities and subsequent maintenance and operation of Applicant's rail line.
50. Should previously unidentified utilities be discovered during project-related construction activities, Applicant shall cease construction, take appropriate action to protect the utility, and contact the utility owner immediately. In the event of damage to any utility during project-related construction or operation, Applicant shall contact the utility owner immediately and take appropriate remedial action.

7.8.4 WATER RESOURCES

51. Applicant shall obtain all Federal, state, and local permits required by the U.S. Army Corps of Engineers for alteration of wetlands, ponds, lakes, streams, or rivers as a result of this project.
52. Applicant shall obtain all necessary Federal, state, and local permits required by the U.S. Army Corps of Engineers for storm water discharge resulting from this project, including National Pollutant Discharge Elimination System permits for project-related construction or reconstruction activities.
53. To minimize sedimentation into streams and waterways, Applicant shall use best management practices, such as silt screens and straw bale dikes, to minimize soil erosion, sedimentation, runoff, and surface instability during project-related construction and reconstruction activities. Applicant shall disturb the smallest area possible around any streams and tributaries, and shall consult with the Natural Resource Conservation Service, Minnesota Department of Natural Resources, South Dakota Department of Game, Fish, and Parks, Minnesota Pollution Control Agency, Wyoming Department of Game and Fish, and the State Departments of Transportation to ensure proper re-vegetation of disturbed

areas as soon as possible following construction or reconstruction activities related to this project.

54. Applicant shall establish staging areas for project-related construction equipment in areas that are not environmentally sensitive in order to control erosion. When project-related construction activities, such as culvert and bridge work, require work in stream beds, Applicant shall conduct these activities, to the extent possible, during low flow or periods when the stream is dry.
55. When engaging in any project-related construction activities near streams, Applicant shall construct any temporary stream crossings as close to a right angle with the stream as possible. Applicant also shall design temporary bridges to span across the ordinary high water elevations of waterways to the extent practical. Following the project-related construction, Applicant promptly shall remove all temporary construction crossings and restore the area to as close to its original condition as possible.
56. Applicant shall ensure that, when used in its project-related construction activities, cofferdams or check dams consist of native material, sheet pile, sandbags, or other engineered designs matching the local site conditions.
57. Applicant shall establish staging and laydown yards for project-related construction at least 50 feet from wetlands or waterways, if topography permits. If topographic conditions do not permit a 50-foot distance, these areas shall be located no less than 10 feet from the water's edge. Applicant shall not clear any vegetation between the yard area and the waterway or wetland.
58. Applicant shall not service project-related construction equipment within 25 feet of wetlands or waterways, and shall refuel all project-related construction equipment at least 100 feet from these sensitive areas.
59. Applicant shall ensure that all culverts and bridges are clear of debris to avoid potential flooding and stream flow alteration. Applicant shall design all project-related drainage crossing structures to pass a 100-year flood. Applicant shall reconstruct the existing rail line and construct the new rail line in such a way as to maintain current drainage patterns as much as possible. Applicant shall regularly inspect and maintain culverts, bridge abutments, and bridges to ensure surface water drainage is preserved.

60. To ensure the integrity of the Flood Control Project in Mankato, Minnesota if Alternative M-3, the existing rail corridor alternative through Mankato, is approved, Applicant shall coordinate with the U.S. Army Corps of Engineers and local agencies in Mankato and obtain any necessary permits, to prevent adverse impacts from project-related rail line construction and operation to flood control structures.
61. Applicant shall employ best management practices to control turbidity and disturbance to bottom sediments during project-related construction or rehabilitation of Applicant's bridge over the Missouri River at Pierre, South Dakota.
62. Applicant shall obtain a Bridge Permit from the U.S. Coast Guard for any project-related activities that would result in the extensive modification of Applicant's existing rail bridge over the Missouri River in Pierre, South Dakota, or for construction of a new rail bridge over the river.
63. Applicant shall complete project-related construction and reconstruction activities through wetlands, when such wetlands extend outside the rail line right-of-way, in continuous segments, in order to minimize both the time required to complete construction and the time land adjacent to wetland areas is disturbed.
64. Applicant shall ensure that any herbicides used in right-of-way maintenance are approved by the U.S. Environmental Protection Agency and are applied by licensed individuals who shall limit application to the extent necessary for rail operations. Applicant shall ensure that herbicides shall not be applied within 150 feet of perennial streams and wetlands to minimize the amount potentially entering waterways.
65. Applicant shall ensure that any wells that could be affected by project-related construction or reconstruction are appropriately protected or capped to prevent well and groundwater contamination. If these wells are located on private land, Applicant must first secure permission from the landowner before undertaking any such activities.

7.8.5 RECREATION

66. Applicant shall ensure that adequate clearances and access are provided for safe navigation of recreational boats on the Missouri River at the location of any project-related rehabilitation or construction of Applicant's bridge across the Missouri River at Pierre, South Dakota. Applicant also shall install appropriate warning devices to notify boaters of project-related bridge construction activities and the location of a safe navigation route.

7.8.6 AIR QUALITY

67. Applicant shall comply with the final recommendations of the Air Quality Working Group, consisting of agencies with appropriate technical expertise which was established for this project, to minimize the impacts of regional haze on Class I airsheds resulting from the locomotive emission of Applicant's Powder River Basin coal trains.
68. Applicant shall comply with the U.S. Environmental Protection Agency emissions standards for diesel-electric railroad locomotives (40 CFR Part 92) when purchasing and rebuilding locomotives.
69. Applicant, to the extent practicable for project-related operations, shall adopt fuel saving practices, such as throttle modulation, dynamic braking, increased use of coasting trains, isolation of unneeded horsepower, and shutting down locomotives when not in use for more than an hour when temperatures are above 40 degrees to reduce overall emissions.
70. To minimize fugitive dust emissions created during project-related construction activities, Applicant shall use such control methods as water spraying of construction areas, tarp covers for haul vehicles, installation of wind barriers, or chemical treatment. Applicant shall also regularly operate water trucks on haul roads to reduce dust.
71. Applicant shall maintain project-related construction and maintenance vehicles in good working order with properly functioning mufflers to control emissions and noise.
72. Applicant shall notify local fire departments at least 4 hours before any project-related open burning and obtain verbal or written permission from the fire departments prior to burning activities.

7.8.7 BIOLOGICAL RESOURCES

73. Applicant shall comply with the terms set forth in the Biological Assessment that has been prepared under Section 7 of the Endangered Species Act, 16 U.S.C. 1531.
74. Applicant shall develop and implement, in consultation with the U.S. Fish and Wildlife Service and South Dakota Department of Game, Fish and Parks, a mitigation plan designed to compensate for the loss of trees, shrubs, and other woody vegetation as a result of project-related construction and reconstruction activities. Applicant's plan shall focus in particular on riparian areas or other areas that are not addressed as part of wetland mitigation.

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75. Applicant shall conduct a survey for raptor nests prior to the initiation of project-related construction activities. Applicant also shall attempt to minimize disturbance to active nests until after nesting has been completed. Applicant shall consult and coordinate with the applicable state agency (South Dakota Department of Game, Fish and Parks, Wyoming Game and Fish Department, or Minnesota Department of Natural Resources) to determine the appropriate action to compensate for raptor nests removed or destroyed during project-related construction activities.
76. Prior to initiating project-related construction activities, Applicant shall consult with the Natural Resource Conservation Service, local grazing associations, and interested landowners, to develop an adequate plan for controlling noxious weeds during construction of the new rail line and related facilities and operation of the new and existing rail line. The plan should include an approved list of herbicides.
77. Prior to initiating project-related construction activities, Applicant shall consult with the Natural Resource Conservation Service, local grazing associations, local fire and emergency response departments, and interested landowners to develop an adequate plan for fire prevention, suppression, and rehabilitation in order to protect natural habitat.
78. Prior to initiating new rail line construction activities in South Dakota and Wyoming, Applicant shall consult with the South Dakota Department of Game, Fish and Parks and Wyoming Department of Game and Fish to develop mutually acceptable under- and overpass designs to protect wildlife, particularly big game.
79. Prior to initiating new rail line construction activities in South Dakota and Wyoming, Applicant shall coordinate with the South Dakota Department of Game, Fish and Parks and Wyoming Game and Fish Department to develop adequate fencing standards and designs to allow for movement of wildlife, particularly big game, across the right-of-way. Applicant shall encourage the use of these types of fencing when negotiating with landowners on fence installation on private property.
80. Applicant shall remove carcasses from the rail line right-of-way as part of normal rail line inspection and maintenance activities.
81. Should project-related construction and operation activities affect previously unidentified threatened or endangered species, Applicant shall immediately cease construction and contact the U.S. Fish and Wildlife Service for guidance on how to protect these species.

7.8.8 GEOLOGY AND SOILS

82. Applicant shall limit ground disturbance to only the areas necessary for project-related construction and reconstruction activities.
83. During project-related earthmoving activities, Applicant shall remove topsoil and segregate it from subsoil. Applicant shall also stockpile topsoil for later application during reclamation of the right-of-way. Applicant shall place the topsoil stockpiles in areas that would minimize the potential for erosion, and use appropriate erosion control measures around all stockpiles to prevent erosion.
84. Applicant shall commence reclamation of disturbed areas as soon as practicable after project-related construction ends along a particular stretch of rail line. The goal of reclamation shall be the rapid and permanent reestablishment of ground cover on disturbed areas. Applicant shall attempt to reclaim disturbed areas prior to cessation of project-related construction activities for the winter to avoid disturbed soils being subject to erosion throughout the winter. If weather or season precludes reestablishment of vegetation, Applicant shall use measures such as mulching, netting, or ground blankets to prevent erosion until reseeding can be completed.
85. Prior to initiating project-related construction activities, Applicant shall consult with the local offices of the Natural Resources Conservation Service, State Departments of Natural Resources, Fish and Game, and State Departments of Transportation, to develop an adequate plan for restoring and revegetating disturbed areas within the rail line right-of-way for each State (including greenstrip seed mix specifications). Applicant shall monitor reclaimed areas for three years. For those areas where efforts to establish vegetative cover have been unsuccessful after one year, Applicant shall reseed annually until vegetative cover is established.
86. Applicant shall take reasonable steps to ensure that fill material used in project-related construction and operation activities is free of contaminants.
87. Applicant shall design and construct the new rail line so as to consider local geologic potentials for slumping and landslides and develop and implement adequate measures to minimize the potential for these to occur.

7.8.9 PALEONTOLOGICAL RESOURCES

88. Prior to engaging in any project-related construction across Federal lands, Applicant shall conduct testing within the proposed right-of-way where there is a potential for paleontological resources of Class 3 or higher. This testing shall be done to the depth below ground surface at which the rail line is anticipated to be constructed. Prior to initiating construction activities in the areas that warrant testing, Applicant shall prepare a paleontological resources report identifying any resources encountered, as well as the strata most likely to contain significant paleontological resources. Applicant shall submit the report to the Board and the appropriate Federal land managing agency. After submitting the report, Applicant shall consult with the appropriate Federal land managing agency to develop appropriate measures to minimize damage to paleontological resources during project-related construction. These measures may include a requirement that the Applicant retain a paleontologist be present during earthmoving activities affecting the strata most likely to contain significant fossil resources.
89. If paleontological resources are encountered during project-related construction activities on Federal lands, Applicant shall immediately cease construction activities, inform the appropriate Federal land managing agency of the identified resource, and arrange for evaluation of the resource and determination of how to protect the resource by a qualified paleontologist. The paleontologist may be employed by the Federal land managing agency, the relevant State Historic Preservation Office, or may be retained by Applicant.
90. Any paleontological resources recovered from project-related construction activities across Federal lands shall remain the property of the United States Government.

7.8.10 NOISE

91. Applicant shall consult with affected communities regarding Applicant's project-related construction schedule, including the hours during which construction takes place, to minimize, to the extent practicable, construction-related noise disturbances in residential areas.
92. Applicant shall install rail lubrication systems at curves where doing so would reduce noise for residential or other noise sensitive receptors.
93. Prior to initiating project-related construction activities, Applicant shall develop a Construction Noise and Vibration Control Plan to minimize construction noise and vibration within the communities along the rail line. Applicant shall designate a noise

7.8.9 PALEONTOLOGICAL RESOURCES

88. Prior to engaging in any project-related construction across Federal lands, Applicant shall conduct testing within the proposed right-of-way where there is a potential for paleontological resources of Class 3 or higher. This testing shall be done to the depth below ground surface at which the rail line is anticipated to be constructed. Prior to initiating construction activities in the areas that warrant testing, Applicant shall prepare a paleontological resources report identifying any resources encountered, as well as the strata most likely to contain significant paleontological resources. Applicant shall submit the report to the Board and the appropriate Federal land managing agency. After submitting the report, Applicant shall consult with the appropriate Federal land managing agency to develop appropriate measures to minimize damage to paleontological resources during project-related construction. These measures may include a requirement that the Applicant retain a paleontologist be present during earthmoving activities affecting the strata most likely to contain significant fossil resources.
89. If paleontological resources are encountered during project-related construction activities on Federal lands, Applicant shall immediately cease construction activities, inform the appropriate Federal land managing agency of the identified resource, and arrange for evaluation of the resource and determination of how to protect the resource by a qualified paleontologist. The paleontologist may be employed by the Federal land managing agency, the relevant State Historic Preservation Office, or may be retained by Applicant.
90. Any paleontological resources recovered from project-related construction activities across Federal lands shall remain the property of the United States Government.

7.8.10 NOISE

91. Applicant shall consult with affected communities regarding Applicant's project-related construction schedule, including the hours during which construction takes place, to minimize, to the extent practicable, construction-related noise disturbances in residential areas.
92. Applicant shall install rail lubrication systems at curves where doing so would reduce noise for residential or other noise sensitive receptors.
93. Prior to initiating project-related construction activities, Applicant shall develop a Construction Noise and Vibration Control Plan to minimize construction noise and vibration within the communities along the rail line. Applicant shall designate a noise

control officer/engineer to develop the Plan, whose qualifications shall include a least 5 years' experience with major construction noise projects, and board certification membership with the Institute of Noise Control Engineering or registration as a Professional Engineer in Mechanical Engineering or Civil Engineering.

94. Applicant shall comply with Federal Railroad Administration regulations (49 CFR Part 210) establishing decibel limits for train operations.
95. Applicant shall consult with interested communities along its new and existing rail line to identify measures to eliminate the need to sound train horns consistent with Federal Railroad Administration standards.
96. If Applicant's proposal to reconstruct its existing rail line through Rochester, Minnesota, is approved, Applicant shall implement a program to minimize vibration resulting from train operations in Rochester, where large amounts of vibration-sensitive equipment are present (e.g. magnetic resonance imaging systems (MRI) of the General Electric 1.5 Tesla Signa series contained in the Charlton North building). The design goal for vibration mitigation shall maintain the current levels of railroad-related vibration.
97. Applicant shall regularly inspect rail car wheels to maintain wheels in good working order and minimize the development of wheel flats (areas where a round wheel becomes no longer round but has a flat section, leading to a clanking sound when a rail car passes). Prior to moving Powder River Basin coal trains, Applicant shall inspect new and existing rail for rough surfaces and grind these surfaces to provide a smooth rail surface during operation.

7.8.11 ENVIRONMENTAL JUSTICE

98. Applicant shall consult and coordinate with the Lakota Sioux Tribe to develop a Hazardous Material Emergency Response Plan to account for the special needs of Native American persons on the Pine Ridge Reservation in South Dakota, particularly those inhabiting Red Shirt, which is located less than 1.0 mile from the new rail line construction under Alternative B. This plan shall include Applicant-sponsored training in hazardous materials response for appropriate tribal personnel.

7.8.12 CULTURAL RESOURCES

99. Applicant shall implement all the mitigation included in the Programmatic Agreement and Identification Plan that has been developed through the Section 106 consultation process under the National Historic Preservation Act.
100. Applicant shall implement all the mitigation included in the Memorandum of Agreement that has been developed to ensure that the concerns of Native American Tribes related to the proposed project which are outside the Section 106 process under the National Historic Preservation Act are considered and addressed.
101. Prior to initiating project-related construction or rehabilitation of Applicant's bridge over the Missouri River located at Pierre, South Dakota, Applicant shall ensure that the Section 106 process of the National Historic Preservation Act is completed for all archaeological sites and historic structures that would be impacted by the proposed project.
102. If archeological resources are encountered during project-related construction activities, Applicant shall immediately cease excavation work in the area and inform and consult with the appropriate State Historic Preservation Office regarding appropriate measures to protect the resource. If the archaeological resource is discovered on Federal lands, Applicant shall contact the appropriate Federal land managing agency and then the appropriate State Historic Preservation Office.

7.8.13 MONITORING AND ENFORCEMENT

103. If there is a material change in the facts or circumstances upon which the Board relied in imposing specific environmental mitigation conditions, and upon petition by any party who demonstrates such material change, the Board may review the continuing applicability of its final mitigation, if warranted.
104. Applicant shall retain a third-party contractor to assist SEA in the monitoring and enforcement of mitigation measures on an as-needed basis until Applicant has completed project-related construction and reconstruction activities, as well as a period covering the first year of project-related operations, or for any period the Board imposes.

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